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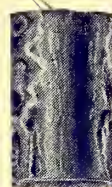
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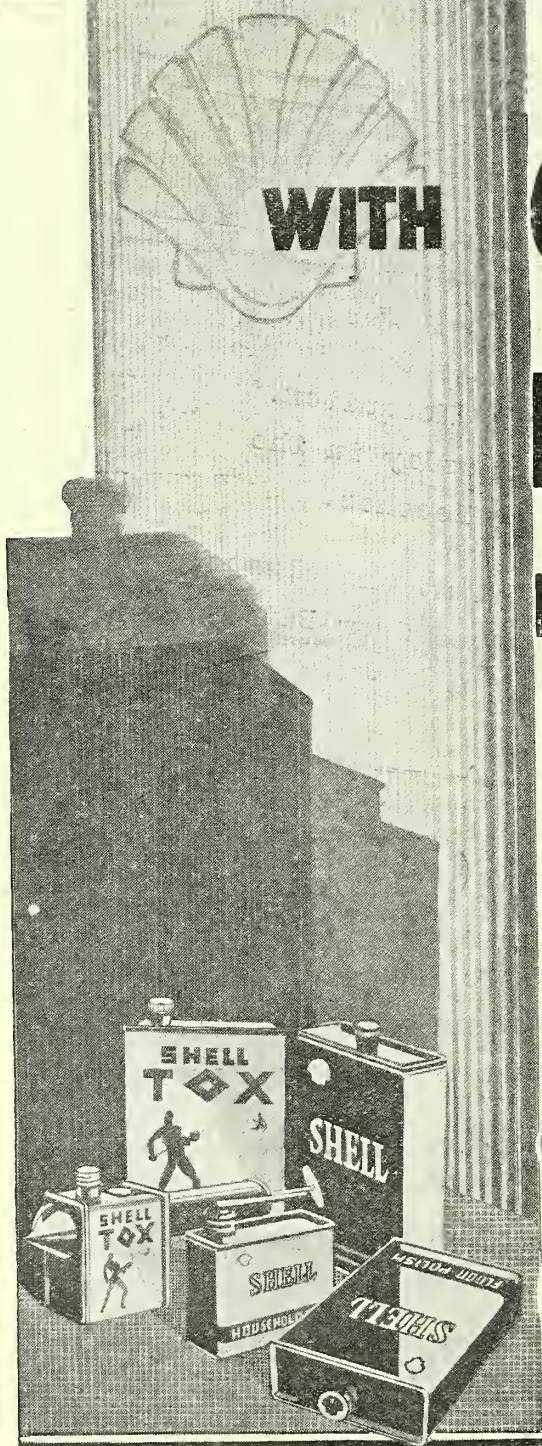
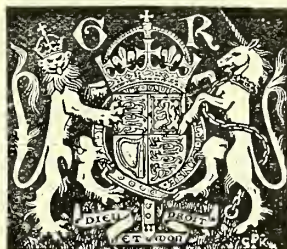


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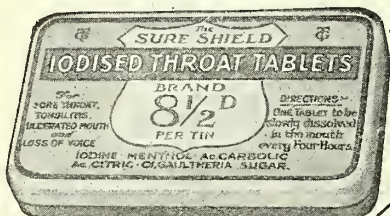
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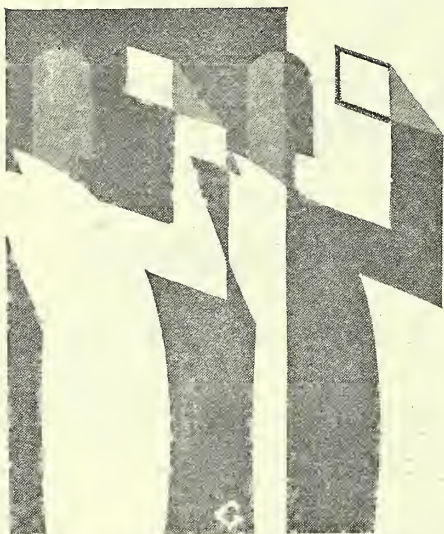
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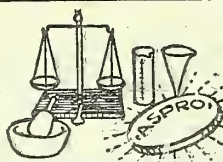


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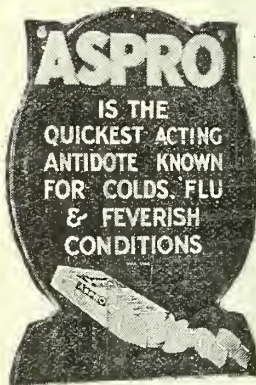


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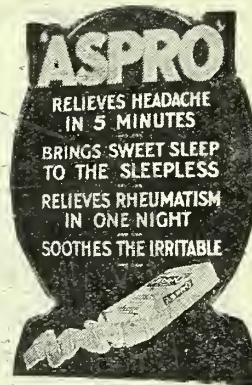
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colours



By featuring 'ASPRO' Displays in your window you link up your store to the largest Medicine Publicity Campaign in the World

Following the success of our recent Man, Nurse and Child Display for Chemists and the many letters of appreciation received we have pleasure in announcing a new 3-piece series now ready for distribution. These productions combine suggestion and reasons why customers should enter your store to purchase 'ASPRO'. The sooner you co-operate by featuring 'ASPRO' Displays—the greater is your opportunity of benefiting by the consumer demand created by our huge advertising campaign. Be first in the field by showing this new 3-Piece Display. Simply fill in name and address and post to Gollin & Co. Pty., Ltd., "Aspro" Dept., Slough, Bucks. The displays will be despatched to you promptly.

17% Extra through buying 'ASPRO' on Bonus Terms.

The 'ASPRO' bonus on unstamped 'ASPRO' is as follows:— On a one gross order for 10's the bonus is one dozen packets; on half-gross order, $\frac{1}{2}$ dozen packets. Half-gross 10's is the minimum order accepted for Bonus purposes. On a 1 gross order for 27's the bonus is 2 dozen packets, on a half-gross order 1 dozen packets, and on a quarter-gross order $\frac{1}{2}$ dozen packets. A quarter-gross order is the minimum quantity. There is no bonus on 5's or 60's.

The conditions are that the Chemist who buys on these terms undertakes to display 'ASPRO' Advertising matter in his shop window for 14 days, and sell at advertised prices. As 'ASPRO' is so extensively

advertised, this action will not only bring customers into the Chemist's shop to purchase 'ASPRO', but should enable the chemist's staff to make other sales to these customers. Acceptance of Bonus is considered acceptance of conditions regarding display and selling prices. For Bonuses it is not necessary to buy both sizes at the same time, i.e., single lots 6 dozen 10's or 3 dozen 27's will qualify the Chemist.

You order as follows:—We do not sell direct to the Chemist. All our business goes through Wholesalers. Orders may be sent either to your Wholesaler or direct to us. If to us, state the name of your Wholesaler, so that we may forward the order on and the Bonus will be supplied direct by us.

Ordinary prices for unstamped 'ASPRO' are as follows:—

3d. size (containing 5 tablets) 2/3 doz.

6d. „ (containing 10 tablets) 4/6 „

1/3 „ (containing 27 tablets) 11/6 „

2/6 „ (containing 60 tablets) 21/- „

Less 2½% 30 days.

NOTE.—The 1/3 size contains two extra tablets. 2/6 size ten extra tablets.

'ASPRO' consists of the purest Acetyl Salicylic Acid that has ever been known to Medical Science, and its claims are based on its superiority.

Made by ASPRO LIMITED,
SLOUGH, England.

Agents:

GOLLIN & CO. PTY. LTD.

('Aspro' Dept.),

SLOUGH, BUCKS.

'Phone: Slough 608.

No proprietary right is
claimed in the method
of manufacture or
the formula.

COUPON for New 3-Piece 'ASPRO' Display.
GOLLIN & Co. Pty. Ltd. ('Aspro' Dept.), SLOUGH, BUCKS.
Please send me above displays.
Name.....
Address.....



C. & D.

EVANSOL
(LYSOL EVANS)

Every Batch Standardised

EVANSOL is the Lysol of distinction; always reliable. It contains 50% distilled cresylic acid; is perfectly soluble in hard or soft water—a pleasant odour, and leaves no "film" on surgical instruments.

Supply "EVANSOL" and you ensure satisfaction. The illustration above shows the attractive Display Material provided, and includes brightly-coloured crêpe paper in two shades.

EVANS SONS LESCHER & WEBB LTD

LIVERPOOL

DUBLIN

LONDON

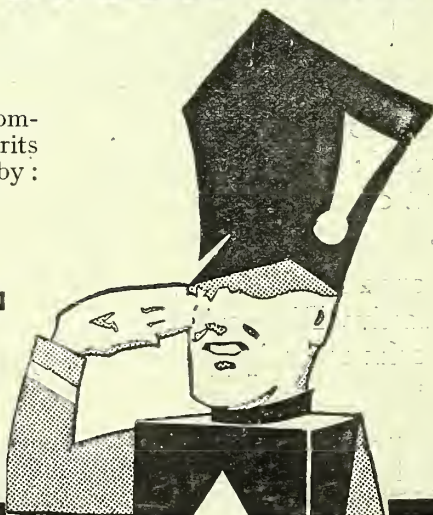
**Selo
sells
— quickly!**

SELO
The fast
FILM
BRITISH
MADE

THE PUBLIC WANT SELO

Joint product, combining all the merits of and distributed by:

**IMPERIAL
ILFORD
ILLINGWORTH
RAJAR GEM
WELLINGTON**



*For Sale in Great Britain
and Ireland only.*

**SELO ADVERTISING
DEPARTMENT
134 St. Albans Road
WATFORD**

AYRTONS • LIVERPOOL

SIGNAL SUCCESS IN PACKED GOODS

Quality
products
with good
pedestal
cut-out
showcards



"H.F." SERIES

In patent sprinkler bottles with fine gilt canopy caps, screwing direct on to the bottle and fitted with efficient cork wads.

"H.F." BRILLIANTINE
Elegant and Refined.

"H.F." VIOLET OIL
An Aristocrat.

"H.F." TOILET PARAFFIN
Delightfully Perfumed.

"H.F." BAY LEAF
BRILLIANTINE
Tonic and Effective.

IN THREE SIZES:

1 OZ.	2 OZ.	4 OZ.
4/-	6/-	8/-
Per dozen		

Creating a DEMAND for "Junofloris" TOILET AIDS!

Thousands of Advertisements Every Day!

WE are creating a demand for our "Junofloris" range of Toilet Aids, with new additions, amongst all purchasers of "HARLENE" Preparations by means of the Literature packed with

all our other goods. Thousands of Satisfied "Harlene" enthusiasts read about them every day—each Customer for any "Harlene" Product is also a potential Customer for "Junofloris" Toilet Aids.

Popular Prices — Good Profits

The profit is very generous and the series comprises:—

"JUNOFLORES "	Prices—Retail
Spring' Breath Tablets ..	7½d.
" " " ..	1/1½
" " " ..	3/-
" " Dentifrice ..	7½d.
" " " ..	1/1½

"JUNOFLORES "	Prices—Retail
Effervescent Mouth Wash	
Tablets ..	7½d.
" " " ..	1/1½
Skin and Complexion Cream	1/3
Vanishing Cream ..	1/3

SELLING TO SATISFIED CUSTOMERS!

"Junofloris" Toilet Aids thus appeal to the most fruitful of all fields—actual satisfied Customers of your own!

WRITE FOR TERMS AND MEET THE DEMAND BY INCLUDING A SMALL QUANTITY IN YOUR NEXT ORDER FOR "HARLENE" PREPARATIONS.

Edwards Harlene Ltd.
20/26 Lamb's Conduit St.,
LONDON W.C.I





A Good Product — Good Selling Aids *A Pharmaceutical Sales Policy*

“**M**INERAL SPRING” is one of the very few nationally known salines with a definitely pharmaceutical selling policy. Its quality ensures “repeats” and the sales policy ensures that the chemist reaps the benefit. Specialise in “Mineral Spring” because, by doing

so, you build up your own goodwill. Keep the “Mineral Spring” show material prominently before your customers—it tells the story naturally but effectively. Window display screens, counter cards and wrappers and circulars printed with name and address are available.

To EXPORT BUYERS—All orders and enquiries should be addressed to our Sole Export Agents
— Wm. ALFRED JONES Ltd., West India House, Liverpool.

THOMAS KERFOOT & CO. LTD.
BARDSLEY VALE, LANCASHIRE,
& Bardsley House, London, N1
ESTABLISHED 1797.

D/878.

COPYRIGHT

OIL of LEMON
SOLUBLE OIL of LEMON
TERPENELESS OIL of LEMON
SESQUITERPENELESS OIL of LEMON

The high standard of **QUALITY** invariably maintained by each of these Lemon products is such as to ensure true **ECONOMY** in use—as well as the maximum of effectiveness for its individual purpose. *Therefore if it's Lemon, ask*

WHITE, TOMKINS & COURAGE, LTD.
REIGATE **Surrey**

Established 1795.

LAUTIER FILS

Works: GRASSE (France) & BEYRUT (Syria).

Essential Oils and Synthetics.
 All Raw Materials for Perfumery.

Olive, Peach Kernel, Sweet Almond Oils
 Floral Waters.

Sole Agents for:—

PAOLO VILARDI *Messina Oils:*
 Lemon, Bergamote, Sweet Orange, etc.

S.A. FLORFE *Spanish Oils:*
 Spike Lavender, Rosemary, Thyme,
 Pennyroyal, etc.

C. MINTCHEFF & KETCHEDJIEFF
Otto of Rose. Bulgarian.

Wholesale and Export only.

LAUTIER FILS, Ltd. 187 Commercial St., London E.1.
 Tel. Add., "Lautiert, Phone, London." Phone: Bishopsgate 8271/2



BY APPOINTMENT

GUARANTEED PURE
ENGLISH
PEPPERMINT
OIL

Grown and Distilled from Mitcham Plants

by
CHIVERS
& SONS LTD.
 HISTON, CAMBRIDGE, ENGLAND

Samples & Quotations on request
 from the sole selling Agents

BRUCE STARKE & CO.

16 WATER LANE, GREAT TOWER ST., LONDON, E.C.3

2 Boxes FREE

with every dozen

Poudre Tokalon

*Also FREE GOODS for you
to give away*

WE OFFER to execute one order only for combined packages; consisting of:

- (a) 1/- Box of Poudre Tokalon
- (b) 6d. Tube of Rose Skinfood

Retail 1/- the two

on the usual trade terms of 1/- Powder only.

MINIMUM ORDER 1 doz. combined packages.

MAXIMUM ORDER 6 doz. combined packages.

AND SPECIAL BONUS FOR YOU

In exchange for your co-operation, with each dozen combined packages:

The same number 1/- Poudre Tokalon with

Free Bonus 2 Boxes to the dozen.

This Offer Definitely Closes August 21

WRITE NOW

for Full Particulars

TOKALON LTD.

212/214 Great Portland St., London, W.1

FREE GIFT SHOW-
CARD, IT WILL
DRAW LIKE A
MAGNET!

Special Today!

TWO
for the price of
ONE

FREE

1/-

Poudre Tokalon

*We supply the Tubes
of Skinfood FREE*

A New Product backed known personally to many HARYSTOR



This will introduce to you Harystor, a preparation for the preservation of the hair, which is compounded according to the formula evolved by Mr. E. W. Blake, following his researches into the causes of hair affection.

Mr. E. W. Blake has a very large following, among whom are doubtless numbered many of your very own customers. With those who know or who have heard of Mr. Blake his name carries great weight. Harystor is being presented to the general public as Mr. Blake's own prescription and

SPECIAL OFFER

We want you to take a real interest in the development of Harystor sales. We, therefore, offer you these special stocking-up discounts. And with all orders for half-dozen and over we give you "Harystor" Display Units to help you to link more closely with the big campaign.

This Offer Closes August 9th.

Special Stocking-up Discounts, over and above the regular Retail Trade Terms of 33½%, will be allowed as follows:—

On order for 3 bottles "Harystor"—Carriage Paid.

On order for 6 bottles "Harystor"—Carriage Paid and 5% extra discount allowed. Also Display Unit for 2 bottles.

On order for 12 bottles "Harystor"—Carriage Paid and 10% extra discount allowed. Also 2 Display Units for 2 bottles each.

MEDICUS LTD.

92 Southbridge Road, Croydon, Surrey.

A NEW

& STEADY

by a Famous Specialist of your Customers Preserves & Beautifies the Hair

therefore is launched with tremendous goodwill, apart from the prestige it will gain as its efficacy becomes better known.

Harystor was first tested by a number of Mr. Blake's patients and their friends to whom they recommended it. So efficacious did it prove that Mr. Blake was persuaded to offer Harystor to the general public.

Never think of Harystor as a one-bottle sale. It is a *course of treatment*. All the advertising and educational literature that forms an important part of the campaign, emphasises that, and repeats it. The public is not being taught to think of Harystor, but of the Harystor Method of Hair Culture. To make the course a success daily and diligent treatment over a course of months is advocated.

HARYSTOR

HAIR-RESTORER
PRESERVES & BEAUTIFIES THE HAIR

Here you see some typical Harystor advertisements. These belong to the introductory series, and open the campaign. You will notice the direct appeal to those who are worried about their hair.

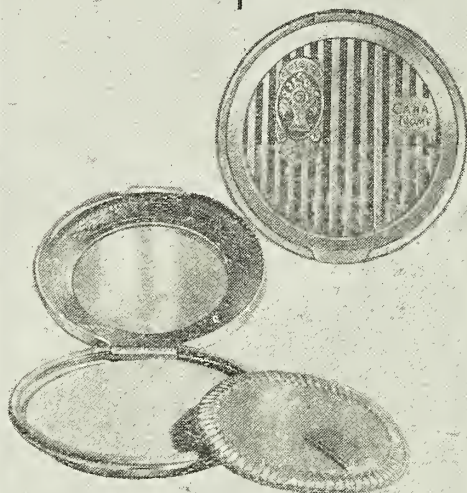
Opening with the tremendous punch of a "Daily Mail" Front Page on August 15th, followed by a succession of other large spaces in this most powerful national family newspaper—and backed up by half-pages in the "Daily Sketch"—the Harystor campaign bursts upon the British Public with unforgettable force.

[illegible]

CARA NOME



Complexion
POWDER
Compact



Powder exquisitely fine and delicate. Blending so well that the observer is conscious only of a soft new loveliness. One of the many CARA NOME beauty requisites, perfumed with the fragrance of early blossom time.

Cara Nome products are sold by

Rexall
CHEMISTS

If there is no Rexall agent in your district, and you would like to know WHY Rexall selling methods are proving increasingly successful, write to:—

UNITED DRUG
CO. LTD.
NOTTINGHAM

DEARBORN (1923) LTD.

37 Gray's Inn Road, London, W.C.1

Telephone: HOLBORN 9669

Toilet Specialties.

	Price per doz. to Retailer	Selling Price P.A.T.A
PILENTA SOAP	10/-	1/-
A complexion soap;		
PROLACTUM	10/-	1/-
For the lips.		
PARSIDIUM JELLY	10/-	1/-
For wrinkles.		
ALLACITE OF ORANGE BLOSSOM	22/6	2/6
A dressing cream.		
BORANIUM	22/6	2/6
A hair tonic.		
CLEMINITE	22/6	2/6
For a face lotion.		
COLLIANDUM (Powder & Solide.)	22/6	2/6
For a face tint.		
PERGOL	22/6	2/6
A deodorant.		
TEKKO PASTE	22/6	2/6
Camphor cream.		
STALLAX	13/6 22/6	1/6 2/6
For a shampoo.		
JETTALINE	31/6	3/6
For clearing the skin		
PHEMINOL	36/-	4/-
A depilatory.		
MENNALINE	36/-	4/-
For the eyelashes.		
MERCOLIZED WAX	18/- 31/6	2/- 3/6
A face cream.		
STYMOL	36/-	4/-
For oily complexions and blackheads.		
SILMERINE	22/6	2/6
Hair-curling fluid.		
BARSYDE	22/6	2/6
Dandruff eradicator.		
TAMMALITE	22/6	2/6
For grey and faded hair.		
LIQUID PERGOL	31/6	3/6
To check excessive perspiration locally.		
BICROLIUM	22/6	2/6
For whitening the hands.		
COCONOIDS	31/6	3/6
For figure development.		
SIPOLITE	18/-	2/-
A new depilatory.		

The Products of

Messrs. PARKER, BELMONT & CO.

CLYNOL BERRIES	36/-	4/-
For obesity.		
SOFT PALERIUM	45/-	5/-
For wrinkles.		
LIQUID NAIL POLISH	10/-	1/-
Brilliant and lasting.		

Stocked by ALL Wholesale Houses.

FOREIGN AND COLONIAL DEPÔTS AND AGENCIES.

South Africa: LENNON, LTD., Cape Town, etc.
SIVE BROS., & KARNOVSKY, LTD.,
Johannesburg.
India: FRAMJEE & SON, Bombay.
A. L. CHOUDRY, Calcutta.
New Zealand: SHARLAND & CO., Auckland and Wellington.
Irish Free State: MAY, ROBERTS & CO., LTD., Dublin.



60% PROFIT ON AMAMI

DAY by day more people are asking for Amami—a nationally advertised gift scheme is making hundreds of eager Amami converts. See that these customers come to your shop. Link up with the press by window displays and take advantage now of this generous Bonus offer.

BONUS OFFER ∴ AUG. 1-31

Write for AMAMI BONUS PARCEL containing

3 doz. 6d. No. 1 Sachets
3 doz. 6d. No. 5 Sachets
3 doz. 3d. No. 1 Sachets
3 doz. 3d. No. 5 Sachets

Cost Price	Selling Price
13s. 6d.	18s. 0d.
13s. 6d.	18s. 0d.
6s. 9d.	9s. 0d.
6s. 9d.	9s. 0d.

INCLUDED FREE!

Three 6d. No. 7 Sachets
Two 6d. No. 8 Sachets
Two 6d. No. 9 Sachets
One 6d. No. 10 Sachets
One 6d. No. 1 Sachets

...	...	...	1s. 6d.
...	...	...	1s. 0d.
...	...	...	1s. 0d.
...	...	...	6d.
...	...	...	6d.
£2	0s. 6d.		
	4s. 0d.		
£1 16s. 6d.	£2 18s. 6d.		

less 10% one month

Carriage Paid



and SHOWCARDS

From your usual Wholesaler or direct from Prichard & Constance (Mfg) Ltd., 11, Broad Street, London, W.C.2

The original combined Cream and Powder

la **VELOUTY**

de **DIXOR** Paris



The advertised line that you are asked for.

NOW ON P.A.T.A.

Samples free upon receipt of trade card or billhead.

PRICES :—Full size pot	- 21/- doz.	RETAIL	2/9
Super tube	- 22/- "	"	3/-
Large tube	- 14/- "	"	2/-
Medium tube	- 7/- "	"	1/-
Handbag tube	- 3/- "	"	6d.

Made in four shades:

WHITE, IVORY, NATURAL and OCHRE.

Obtainable from your regular Wholesaler or direct from the Sole British Agents:

DEBACQ & HARROP,

68 Newman Street, Oxford Street, London, W.1.

Sole Distributors for

Northern Ireland: ROBERT MAYRS & CO., 43 Chichester Street, BELFAST
Irish Free State: MAY ROBERTS & CO. LTD., Grand Canal Quay, DUBLIN

Two of the Best!



... for
steady
sales.

TRADE TERMS

12/- doz.
Retail at 18/-
20/- doz.
Retail at 30/-

SHOWCARDS & CUTOUTS

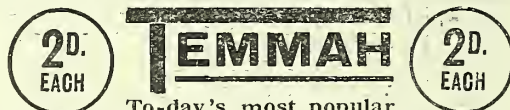
A supply of attractive
Showcards and Cut-
outs for Window
Display sent post free.

**ANZORAPERFUMERY
CO., LTD.**

London, N.W.6.

Men who use Anzora
never change—they
know it to be the
finest hair fixative. That is
why Anzora Cream and
Anzora Viola are in constant
demand. Never "run out"
of Anzora—you'll lose sales
if you do! All reputable
wholesalers stock Anzora,
but if you have any difficulty
write direct.

ANZORA
MASTERS THE HAIR



To-day's most popular

SAFETY RAZOR BLADE
TO FIT ALL 3-PRONGED HOLDERS

Compare with other makes **THE PROFITS YOU EARN**
on these terms:—

15s. Per Gross, less 10% Discount

CASH WITH ORDER OR C.O.D.

PLUS BONUS OF 2 DOZ. PER GROSS.

Orders executed on S/R basis nett.

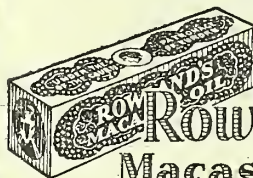
TEMMAH PRODUCTS, LTD.

14-16 LOWER CLAPTON ROAD, LONDON, E.5.

For 137 years

Rowland's Macassar Oil has been a
favourite dressing for the hair. It keeps
the hair healthy, and prevents the encroach-
ment of greyness and baldness.

Of all Wholesalers.



**Rowland's
Macassar Oil**

RETAIL,

3/6, 7/- & 10/6

P.A.T.A.

Red for
dark hair
Golden
for fair or
grey hair

A. ROWLAND & SONS, Ltd., 112 Guilford St., London, W.C.1

A
reduction that
means an
increase -



These reductions are being widely advertised in the national press during August, and an increase in your display of *Pond's Skin Freshener* and *Cleansing Tissues* during the same period should enable you to make many extra sales and secure new custom for these two lines. Both make very attractive material for display purposes, and we shall be pleased to send you show-cards, etc., on application. Let us know your requirements—a postcard will do.—POND'S EXTRACT CO., 103 St. John Street, London, E.C.1.

RETAIL PRICES :—

<i>Cleansing Tissues</i>	- - -	2/-, 1/3 and 9d.
<i>Skin Freshener</i>	- - -	4/-, 2/6 and 1/-.

bigger sales of

POND'S

**Skin Freshener and
Cleansing Tissues.**

SPHERE SUPERB POWDER PUFF

A new Puff made of Sylkie-down Velour. The pile on this beautiful puff is produced in such a way as to retain just sufficient powder to enable the user to apply it smoothly and evenly, without streaks, as is the case with coarser materials.

Supplied in assorted colours and sizes.

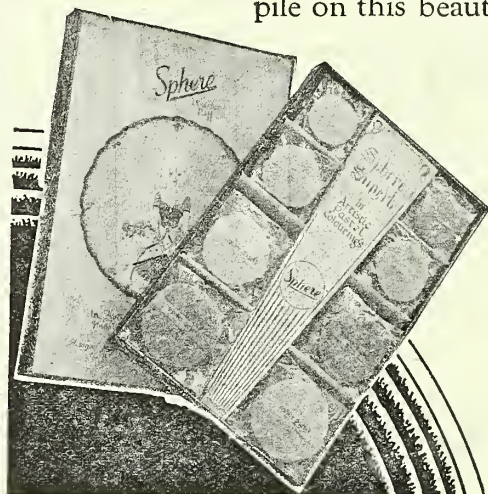
ATTRACTIVE DISPLAY BOX.

No. PF 50 as illustrated, 2 doz.
in a box ... 6/6 per box.

Assorted Six Puffs each 2", 2½", 2¾",
and 3¼" to the box.

Wholesale only:

FAIRE BROS. & Co., Ltd., Leicester.



Countless women now tint their hair at home

Women who had never before thought of tinting their own hair now use Nuctone regularly. Nuctone is the *guaranteed safe* method of hair recolouration and can be used at home just as successfully as by the professional hairdresser. There are no poisonous ingredients in Nuctone. Nuctone restores the natural colour of the hair simply by *developing* the pigmentation that has been lost. *Anyone* can use Nuctone successfully. And Nuctone tinted hair, remember, is unchanged by exposure to fresh air or by frequent shampooing. *Your customers want Nuctone*—be ready with a supply!

NUCTONE

FOR GREY HAIR

GRADUAL In four shades — Nuctone and Nuctone Concentré, Nuctone Eclairé and Eclairé Concentré.

3/9 per bottle, 32/- per dozen.
6/6 per bottle, 52/- per dozen.

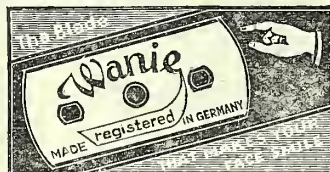
INSTANTER In nineteen natural shades.

4/6 per tin, 33/- per dozen.
6/6 per tin, 48/- per dozen.

Order through your usual wholesaler, or from

J. C. GAMBLES & CO., LTD.

211 BLACKFRIARS ROAD, LONDON, S.E.1



**IF IT
SHAVES
IT'S
WANIE**

**The Blade that SELLS as it SHAVES—
“LIKE GREASED LIGHTNING!”**

Obtainable from all leading Wholesalers.

FREE SAMPLE ON REQUEST

Dept. C.D., WANIE DISTRIBUTING Co., 89 Aldgate High St., E.C.3
North'n Distributors: S. KALISKY (Aldgate) Ltd., 16 Withy Gv., Manch't'r
Irish Free State Agents
Messrs. W. A. FREEDMAN & CO., 21 Merchant's Quay DUBLIN



**Let the “GEM”
make money for you**

*Write for particulars and
name of local agent to the
manufacturers:—*

**THE GEM
AUTOMATIC WEIGHING
MACHINE COMPANY
LIMITED**

46 NEW CITY ROAD
GLASGOW C.4

QUALITY AND QUANTITY

WHEN CONSULTED ABOUT DYES, ALWAYS RECOMMEND

LUTON STRAW HAT DYES

(The Chemists' Standard Hat Dye, 12/- per doz. Retail P.A.T.A. 1/4

AND

AURORAL COLD WATER DYES

(The Fastest Selling Cold Water Dye, 4/- per doz. Retail P.A.T.A. 6d.)

The **QUALITY** of both is the **BEST OBTAINABLE**, because they are the outcome of 50 years' experience in this class of work. The very finest raw materials go to their production, while every batch of colour is carefully tested before being packed for sale. The **QUANTITY** of Dye is **ADEQUATE FOR ITS PURPOSE**. Bigger Straw Hats are now the universal fashion, while many of these are of a very absorbent nature. The quantity of Dye in the **LUTON** bottle eliminates the annoyance of half covering a hat and then finding that there is not enough to finish the job. In the same way the **AURORAL** packet contains sufficient Dye to give a full rich shade in all ordinary cases, thus obviating unsatisfactory half-dyed effects and weak and uneven results.

BY PUSHING LUTON AND AURORAL YOU WILL

Guard Your Reputation and Ensure Your CUSTOMERS' GOODWILL

**VERY SPECIAL
PRICES & DISCOUNTS
are also allowed to
Overseas Buyers**

Write for Export Catalogue

NOTE THE PROFIT:

All orders subject to 5% for Cash in 7 days.

£4 Assorted orders subject to 2½% in addition to 5% for Cash in 7 days (=OVER 52% on outlay).

£8 Assorted orders subject to 5% in addition to 5% for Cash in 7 days (=OVER 57% on outlay).

For Patterns and Particulars of a Full Range of Stains, Varnishes, Colours and Dyes for all purposes, write TO-DAY to

WHITAXER & CO. (KENDAL), LTD., Dye Specialists for Chemists **KENDAL, ENG.**

A. S. LLOYD'S EUX-E-SIS.

For Shaving
without
Soap, Water,
or Brush.

CAUTION.

The Labels on GENUINE EUXESIS bear
two signatures—A. S. Lloyd, in black
ink, and that of his Widow, Aimée
Lloyd, in RED. Refuse any other.

Tubes 1/6 & 3/- ~ 33 $\frac{1}{3}$ % Profit

Sole Manufacturers
and Proprietors :

AIMÉE LLOYD & Co., Ltd.

23 PANTON STREET, HAYMARKET, LONDON, S.W.

N.B.—When ordering from Wholesale Houses write LLOYD'S EUXESIS (WIDOW'S).

BATH &
TOILET
SALTS
DE LUXE

Nymphaea

INSTANTLY
SOLUBLE
EVEN IN COLD WATER

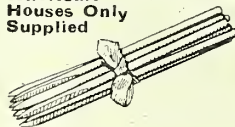
Retail: 1/-, 3/6 & 6/6 P.A.T.A.

Patentees & Sole Manufacturers

SUPERFINE CHEMICALS, Ltd., FELTHAM, MIDDLESEX.

BRITISH GOODS
that meet foreign competition

Wholesale
Houses Only
Supplied



**Manicure
Requirements**

CARDED AND
BOXED

Phone No.:—
Archway 2144

It will pay you to ask
us for our prices

ROBERT LEE, 14 Calverley Grove, N.19.

1/3 PROFIT ON EVERY
BOTTLE SOLD

The new eyebrow
beautifier, "PERM
BROW," has gained
the instant approval
of smart women
everywhere. It is
waterproof, does not
rub off, is easy to
apply, and lends a
lasting charm.

**PERM
BROW**

Our consistent con-
sumer advertising
has created an in-
creasing demand.
Get a stock now—
every bottle gives
you 1/3 PROFIT!

Obtainable from all
wholesale houses or
direct from our West
End sales office:—

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They cost more
because
they



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JOHN WATTS (Sheffield & London) Limited
Lambert Works, SHEFFIELD. Established over 150 years.
London: 18 Soho Square, W.1

The New Watts
"Mirror" Blades

These wonderful Blades with
their Rustless Reinforced
Edges of Stainless Steel
treated by a secret process are
worth the extra cost. They are
keener and give more and
better shaves than any others
on the market. The Edges are ab-
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Packed in Patent Spring Lid
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10 for 5/-

Also Packed in cartons of
5 for 2/6

Giving the Retailer 66 $\frac{2}{3}$ %
PROFIT on cost.

JOCK'S CONVERSION

DAVIE : " I say, Jock, what d'ye think about trying H.B.T. Aseptic Shaving Soap? It's a rare soap."

JOCK : " Nae fear—I've got the best shaving soap in the world. Naething can beat ' ———.' "

DAVIE : " But ye have na' tried H.B.T."

JOCK : " Naw, an' I don't intend to."

DAVIE : " Your mind's evidently made up—but we'll see."

[A month passes and Jock appears on the scene again.]

DAVIE : " Well, any hope of your trying H.B.T. Shaving Soap yet?"

JOCK : " Nae hope. I've telt ye already ye canna beat ' ———.' It's the best I've ever had."

DAVIE : " Wait till you try H.B.T., that'll change your tune."

[Another month passes, and the battle is renewed.]

DAVIE : " Good day, Jock, is that shaving soap of yours done yet? Mind ye, I want you to try H.B.T."

JOCK : " Weel, it's jist aboot dune, and, to please ye, I'll take a stick o' that H.B.T. ye're talking sae much aboot—but mind ye it canna beat ' ———.' "

DAVIE : " You just wait and see. There's the H.B.T. Aseptic Shaving Soap for you, and you'll enjoy your shave now."

JOCK : " Weel, I'll gie it a fair trial, but it canna beat ' ———.' "

[A further month elapses, and as the two meet again, Davie made to speak, but Jock was first with : " Ye're richt, Davie, ' ———.'s' no in it."]

" I knew that," replied Davie. " It's what everybody says that tries H.B.T., for ' THE PROOF O' THE PUDDIN' 'S THE PREEN' O' T."

[So another face shines with the satisfaction of H.B.T.]

H.B.T. ASEPTIC TOILET & SHAVING SOAPS

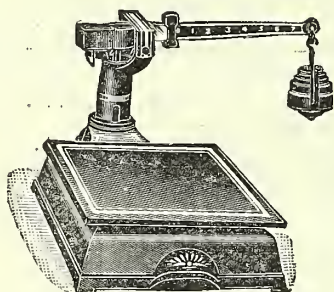
Made with the Expressed Juices of Living Plants

THE SOAP WITH NO SOAPY TASTE

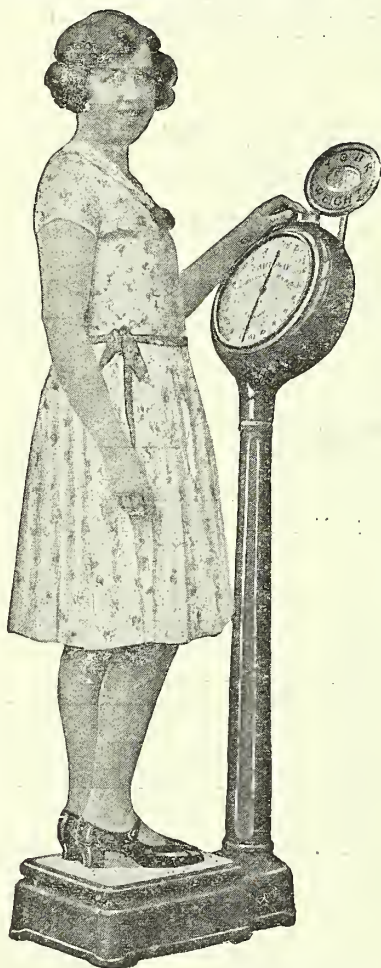
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B.C.M./H.B.T.

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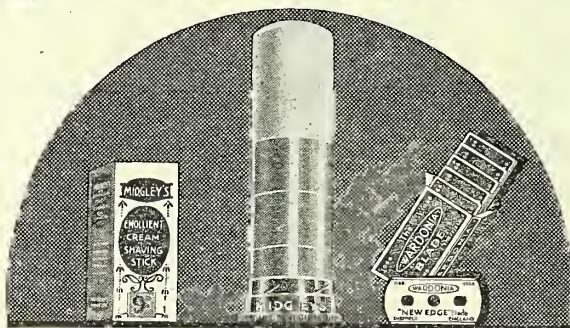
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172 Chapel St., Salford, MANCHESTER

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Genuine 9d. Midgley's Full-size Shaving Stick with each 1/3d. packet of Wardonia "New Edge"

Blades purchased.

That's the offer thousands of retailers are making good profits on. Widely advertised in the National and Provincial Press. Generous supply of Window and Counter Display Matter **FREE** with every order. Delivery guaranteed of first order whatever quantity, so order *generously and at once* from your usual wholesaler or direct

Enormous Demand

Order at once

50% PROFIT FOR YOU

TRADE TERMS:—

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(per carton) 21/-
- 5 Cartons
(per carton) 20/-
- 10 Cartons
(per carton) 19/-
- 20 Cartons
(per carton) 18/-

How Packed:
In attractive Display Carton CONTAINING—

24—PACKETS of 5 WARDONIA Blades & 24—9d. Midgley's Shaving Sticks.

RETAIL VALUE OF ABOVE CARTON **30/-**



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Sole Makers:

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Wardonia Works, Sheffield, England

3 Popular and Profitable Preparations

POPPŒA Vanishing Cream - 6d. 4/- Doz.
POPPŒA Powder in Sifter Box 1/- 8/- „
POPPŒA Perfume - - 1/- 8/- „

The above are 'Best Sellers' and well advertised.

There are Special Display Terms which show over **50%** profit.

Send for full particulars.

We spend a large proportion of our advertising appropriation with Chemists.

TAKE ADVANTAGE OF THIS OPPORTUNITY.

SOLE MANUFACTURERS: **PAPIER POUDRÈ, Ltd., 46 Baker St., London, W.1**



Profit by the line that solves a problem of your customers



Perfumed BATH AMMONIA is the line that many chemists are finding an unrivalled winner of personal goodwill for themselves. Everywhere chemists' customers are keen to find a satisfactory water-softener and refreshing addition for baths, and here it is in the ideal form for the progressive chemist.

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*The Brush
which is
asked for*

There is only one hair-brush which is equally suitable for people of both sexes and all ages:—The "MASON PEARSON" Brush. It brushes much more quickly than any other brush. It brushes more efficiently. It cleanses the scalp more gently and thoroughly than any other brush. It disentangles long hair without tugging it, and restores the "set" to ruffled hair.

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The brushes are made in eight models, retailing from 3/6 to 18/6, all subject to generous discounts giving you a substantial living profit. Can be supplied through your usual wholesaler.



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at ANY price

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50% PROFIT
ON COST

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Established 1880.

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Dental Plate Brush



Made with Extra Stiff Bleached
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THE INCOMPARABLE
BLADE THAT SHEWS
120% PROFIT



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"AMO"
SHAVING
PRODUCTS

Naturally Advertised, OBTAINABLE OF ALL WHOLESALERS.
FREE SAMPLE BLADE AND ILLUSTRATED LIST ON APPLICATION TO—
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Some paramount reasons why you should sell— **SHERLEY'S**

DOG & CAT MEDICINES

LACTOL & LACTOL BISCUITS!



Famous kennels rely upon Sherley's. Breeders and owners use Sherley's. Both the expert and the amateur are buyers of Sherley's. Champions of all Breeds have been reared on Sherley's LACTOL & LACTOL BISCUITS.

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SPECIAL QUANTITY TERMS

are available for the famous Sherley Tonic and Condition Powders and Worm Medicines—now packed on attractive display cards—also for £2 assorted parcels.

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Continuous and Steadily Advertised Goods FOR DESTROYING RATS AND MICE

DANYSZ VIRUS

Retail Price (Protected).	Net Wholesale Price
Virus for Rats and Mice, single tube 2/-	.. 15/- per doz.
5 tubes, 5/-	
Virus for Mice only - single tube 1/6	.. 9/- ..
5 tubes, 5/-	

Date-expired tubes returned to us postage paid will be exchanged free of charge.

Danysz Virus in Liquid Form

Retail Price.	Wholesale Price
Quart Bottles 6/- each	4/6 each
Pint " 4/6 "	3/9 "

HALLER'S EXTRACT OF SQUILL and DANZO RAT KILLER

Discount off Retail Prices 25% Monthly Account, or 33 1/3% cash with order.

	Retail	Monthly a/c	Cash with Order
1/2 gall. tins ..	10/-	7/6	6/3
1 " ..	18/-	13/6	12/-
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DANZO BEETLE POWDER

For destroying Blackbeetles, Cockroaches, Crickets, &c.			
Retail Prices (Protected).	Wholesale prices per doz.		
In tins 3d.	..	..	In boxes of 2 doz. 2/1
6d.	..	..	1 3/8
1/-	..	..	1 7/8
2/6	..	..	1 13/8

Danzo Beetle Powder will not deteriorate by keeping.

CARRIAGE PAID ON ALL ORDERS.

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Watts' Embrocation, or Curb Bott'l.
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LIGHTEST—MEDIUM—DENSE.
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ACCURATE POISON BOTTLES

GUARANTEED FULL CAPACITY.

These bottles are much stronger than hand-made and reduce breakages to a minimum.

2 oz. 14/6, 3 oz. 16/6, 4 oz. 18/6, 6 oz. 22/-, 8 oz. 23/- gross.

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Brilliant Amber Glass, English
Machine Made, Hexagonal.

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A profitable, easy selling,
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SHADEINE FOR TINTING GREY HAIR

This popular article is largely advertised
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Trial size 8d. per doz. 6/-

1/4 size, per doz. 12/-

2/6 size, per doz. 24/-

3/9 size, per doz. 36/-

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Teasdale's Chlorodyne

Shows the best profit to the Chemist
and is the cheapest to the Customer.

NO Signature Required. Sold by CHEMISTS ONLY.

From all the leading WHOLESALEERS. TERMS FROM
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The Teasdale's Chlorodyne Co. HUDDERSFIELD

TATCHO Sample Size 6^D

THE
HAIR RESTORER

PROMOTES, PRODUCES,
BEAUTIFIES THE HAIR

1/3 size .. 12/6 per doz.
2/9 size .. 26/- per doz.

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6 Bottles in Case for
Counter Display,
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"REGULOL" The Perfectly Stable Emulsion of

Liquid Paraffin with Agar-Asar, and well recommended by the
Medical Profession as a Remedy for CONSTIPATION. Two
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500 Handbills with 1 doz. COSTS 1/4. SELLS 2/6

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POTTER'S VITALIZING FRUIT SALINE

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HEALTH SALT
 4 oz. tins ... 4/9 dozen
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LIVER SALTS
 4 oz. tins ... 5/- dozen
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 Handsome Showcard with all orders

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Drug Merchants---Manufacturing Chemists
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 Phone:-Bishopsgate 4761-5 lines. Grams:-Horsehound, phone London. (2 words)
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"LIPVAC" Flasks have that certain distinction in design and manufacture which cannot fail to attract.

"LIPVAC" 50 is VERY NEW and leads the way in sales because of the:—



VACULITE CUP
POURING LIP
TRIPLE STRENGTH GLASS
DAZZLING BRIGHTNESS
DISTINCTIVE APPEARANCE
and is FAIRLY PRICED



Pint size 3/11 } TRADE
Quart size 6/6 } Less 33 1/3%

Stocked and sold by your wholesaler and guaranteed by:—

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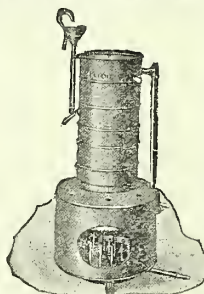


and ensures the confidence of your customers.
3/6 per doz. to retailing 6d.
From the Trade at each.
From LEWIS SMITH, M.P.S., Hereford.

**BONVET
DOG POWDERS**

THE SCIENTIFIC CURE FOR
**DISTEMPER
SKIN DISEASES
CONSTIPATION
LOSS OF
APPETITE
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WORMS**

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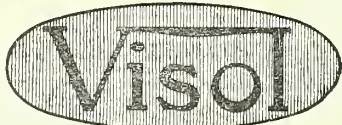
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Extraordinarily efficient and economical. Made for gas, steam, oil or coke fire heating. Full particulars and prices free on application

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A prolific egg-producing and disease resisting specific fortified with greater potency by a special process of Radio-Activity in manufacture. Indispensable to every Poultry Breeder. A remunerative line which every chemist should stock.

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The selling has been done before the mother reaches the chemist, and, having supplied her, it is only common sense to claim she will buy other family necessities from him. Moreover, the continuous demand for it produces a quick turnover.

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'SKETOFAX'

BRAND

AROMATIC CREAM

provides protection against mosquitoes

'SKETOFAX' acts as a deterrent against the attacks of mosquitoes, gnats, midges and sandflies.

Customers who make its acquaintance only after they have been bitten find it a very soothing application.

The convenient tube-packing makes 'SKETOFAX' specially easy to stock and sell.

Prices in London to the Trade : Collapsible tubes at 12/6 per dozen (Subject to the usual discount)

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"MILK OF MAGNESIA" (Regd.)
 AND
"DANDERINE" (Regd.)

QUANTITY DISCOUNTS—5% on 6 doz. 1/3 size or equivalent } and 2½% for cash on the 7th prox.
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WILL BE ONE OF YOUR BEST SELLING LINES

The Special Appeal created by our Advertising and Show Material will secure increased demands over the wonderful SALES RECORD of the past winter.

ARE YOU SHOWING the SUMMER SHOW CARD!

if NOT you should apply for one, it will be gladly sent.

OUR SPECIAL BONUS OFFER IS STILL AVAILABLE

*It nets you over **55%** on Selling Price*

CUCUMEL costs 12/-doz. and sells at 1/6 per bottle

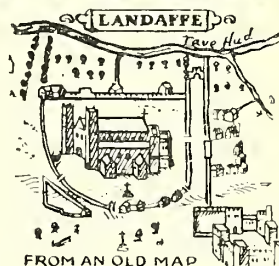
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Conference Number

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Vol. 113. No. 4.

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English and Welsh News

The Editor will be obliged if subscribers will send him marked copies of newspapers containing items of interest for insertion in this or other news sections.

Tinctures and Spirits of Wine Regulations

The Tinctures and Spirits of Wine (Amendment) Regulations, 1930, dated June 23 (Stationery Office, 1d.), provide as follows:—

(1) Notwithstanding anything in the Principal Regulations any tinctures or spirits of wine (including absolute alcohol) removed for exportation or shipment as stores may, if the Commissioners shall in any case so allow and subject to such conditions as they may prescribe, be packed separately or as forming part of a consignment of other tinctures or spirits of wine in quantities and in containers other than the quantities and containers specified in the Principal Regulations.

(2) These Regulations shall be construed together with, and as part of the Principal Regulations, and may be cited as the Tinctures and Spirits of Wine (Amendment) Regulations, 1930.

Merchandise Marks (Imported Goods), No. 5 Order

The Merchandise Marks (Imported Goods) No. 5 Order, 1930, which comes into force three months after June 26 (Stationery Office, 1d.), defines malt products, orders an indication of origin on selling or exposing for sale, and prescribes the following conditions of labelling:—

The indication of origin shall be printed, stencilled, stamped or branded on the container, or on a label securely attached thereto, indelibly and in a conspicuous manner, in plain block letters not less than one-twelfth of an inch in height when the greatest dimensions of the container does not exceed six inches, not less than one-eighth of an inch in height when the greatest dimension of the container exceeds six inches but does not exceed fifteen inches, and not less than one-half of an inch in height when the greatest dimension of the container exceeds fifteen inches. For the purpose of this Order, the expression "greatest dimension" shall mean the height, length or breadth, whichever is the greatest, of a rectangular or approximately

rectangular container, and the height or maximum diameter, whichever is the greater, of a cylindrical, oval or conical container.

Birmingham

The Messel medal for services to the chemical industry was presented by the Society of Chemical Industry to Lord Brotherton at its recent annual meeting in Birmingham.

Among those present at the annual meeting of the Society of Chemical Industry was Mr. C. J. House, B.Sc., who was looking remarkably well. He is home on six months' leave after three years as analyst in the Government Laboratories at Bangkok, Siam.

A collision occurred recently between a motor car and a Corporation vehicle outside the premises of Bellamy & Wakefield, chemists, Easy Row. The car caught fire and Mr. Thomas, of that firm, rendered first-aid to the chauffeur's burns before the latter was conveyed to the hospital.

Liverpool

The continuous bad weather has played havoc with the photographic side of local chemists' business.

Mr. H. Humphreys Jones, principal of the Liverpool School of Pharmacy, is reported to be progressing favourably after his recent operation.

The many Liverpool friends of Mr. W. J. Williams (Francis Newbery & Sons, Ltd.), who is a native of this city, will be glad to hear that he has recovered from his recent illness, and is going to Ilfracombe to recuperate.

Manchester

Mr. H. Watts, chemist, Stretford, has won the cup this year presented by Mr. W. H. Aldcroft to Stretford Wednesday Bowling Club.

A presentation was made on July 18 to Professor F. E. Weiss, Professor of Botany and Pro-Vice-Chancellor at Manchester University, to mark his retirement from the George Harrison Chair of Botany and the directorship of the Botanical Laboratory, which he has held since 1892.

The Salford stipendiary magistrate heard on July 16 six summonses against Ernest Charles Adams, Oxford Street, who pleaded "Guilty." In two instances Adams was accused of selling a liquid preparation of carbolic acid in bottles which were not distinctly labelled with the name of the poison; two other summonses charged him with selling the poison in bottles which were not distinctly labelled with the word "Poison," and the remaining two were for selling the liquid in bottles which were not labelled as to the proportion which the poison contained in the preparation bore to the other ingredients. Mr. W. H. Robinson, prosecuting, stated that the defendant described himself as a drysalter and the keeper of a drug store, but he had no medical or chemist's qualification. Evidence of purchase having been given, Adams was fined £2 on each of the six summonses, with £3 3s. costs.

Sheffield

Mr. F. Hindle, chairman of the Sheffield Pharmaceutical Committee, is on holiday on the Continent.

An inquest was held at Sheffield, on July 18, on the body of Harry Morris, whose death, according to medical evidence, was due to lysol poisoning. A verdict of "Suicide" was returned.

Mr. John Austen, Ph.C., the newly-elected chairman of the Sheffield and District Branch of the Pharmaceutical Society, is managing director of G. T. W. News-holme, Ltd., chemists, High Street. He is an authority on local pharmaceutical history, president of the Rotary Club, and a past-president of the Sheffield Pharmaceutical and Chemical Society.

Miscellaneous

POISON-LICENCE APPLICATION.—Mr. W. L. Stones, of Whaw, Arkengarthdale, Yorks, has applied for a licence to sell agricultural and horticultural poisons.

THEFTS.—During the night of July 14 the premises of Mr. W. G. Shreeve, chemist and druggist, Hamlet Court Road, Westcliff-on-Sea, were entered by burglars, who stole a sum of money.—A window at the premises of Taylors (Midland), Ltd., chemists, Barking Road, London, E., was smashed on July 21 and a number of cameras and other articles were stolen.

POISONING.—An inquiry was held at Haydon Bridge, on July 18, into the circumstances attending the death of a man named Brown. Mr. R. H. Bell, Ph.C., Hexham, stated that in ordering 2 oz. of barium sulphate he unfortunately wrote sulphide. The coroner expressed the opinion that there was nothing criminal about the action of Mr. Bell, but it was unfortunate that having ordered the sulphate from another chemist he had not examined the packet before labelling it and sending it to the doctor. The jury's verdict was that Brown died from the effect of barium sulphide, supplied in error for barium sulphate.

IN THE COURTS.—In Chester County Court, on July 15, the Pharmaceutical Society of Great Britain obtained judgment in the sum of £5 against Salt & Co., grocers, Tattenhall, in respect of a sale of asthma cure containing a scheduled poison.—At London Sessions, recently, the appeal of Reginald Nitch-Smith against a conviction under the Dangerous Drugs Acts (*C. & D.*, May 24, p. 626) was dismissed, but the fines were reduced to £25.—At Marlborough Street Police Court, London, on July 21, Robert W. Tompkins was charged with breaking into the premises of Marsdens' Stores, Ltd., 79 Tottenham Court Road, London, W.1, between July 19 and 21, and stealing twelve cameras, value £34 9s. 6d. Accused was sent for trial.

Scottish News

Brevities

"The Career of a Chemist and Druggist" is the subject of an article in a recent issue of the "Montrose Standard."

"Dundee Doctors in the Sixteenth Century" is the title of two interesting papers by Dr. R. C. Buist, recently reprinted from a medical journal.

Mr. William David Steele, chemist and druggist, 127 High Street, Dumbarton, has executed a trust deed in favour of J. Wilson Crawford, C.A., 17 High Street, Dumbarton.

Brilliantly fine weather favoured the annual picnic of the Sandilands Chemical Works, Aberdeen, which was held at Milltimber, in the Lynn Park. The party numbered 400.

After an illness lasting for some months, the death has occurred at his residence, Bellevue, Crail, of Mr. William Browning, retired manufacturing chemist, at the age of sixty-four.

The Secretary of State for Scotland has appointed Mr. A. Froude to be Registrar-General for Scotland in succession to Dr. J. C. Dunlop, whose retirement under the age limit will take effect on September 3.

Photography, as popular as ever, has stimulated business this month, but increasing competition from outside sources has reduced the individual volume of business. In photography truly "the race is to the swift."

Mr. W. Seamans Jack, chemist and druggist, who carried on business in Galsoun for many years, and who recently disposed of the business and went to Canada, has been appointed manager of the Canadian branch of The British Drug Houses, Ltd.

Mr. Alexander Chalmers (who was at one time manager of the Scottish Acid & Alkali Co., Kilwinning, and who retired from business two years ago owing to illness) and Mrs. Chalmers have just celebrated their golden wedding.

There has been a marked increase in the number of new retail chemists' businesses opened in Scotland recently. Country villages, formerly considered insignificant, are receiving attention, but the ploughing of such furrows will be long and stiff. The increasing unemployment problem has no doubt been a factor in this increase.

At a meeting of the Dundee Insurance Committee Mr. George Clark raised the question of the difficulty of getting prescriptions dispensed on Wednesday afternoon, the chemists' half-holiday, and said that one shop in each locality should remain open by arrangement among the chemists themselves. It was agreed that the Medical Benefit Subcommittee consider the suggestion.

Alexander Dey Gordon, commercial traveller, employed by Regent Chemicals, Ltd., Craigleith, Edinburgh, was sentenced to thirty days' imprisonment at Aberdeen Sheriff Court for having embezzled £1 6s. 6d. belonging to his employers. The money had been collected from customers in Aberdeen and accused stated in Court that the firm owed him money and that he thought he was entitled to take it from the amount collected by him.

Fife

Miss A. D. Wilson, daughter of Mr. T. Wilson, Ph.C., Burntisland, has passed the final examination for the M.B., Ch.B., degrees of Edinburgh University.

Mr. Peter Fenton, F.S.M.C., chemist and druggist, Kirkcaldy, who is at present on holiday at Taynuilt, Argyllshire, writes that the hills are richly covered with digitalis and other medicinal plants.—Miss J. C. B. Fenton, Mr. Fenton's elder daughter, who is a domestic science teacher in Hull, was successful at the recent examinations of the Institute of Hygiene, London, in obtaining the M.I.H. diploma.

Irish News

Pharmaceutical Society's Examination Results

The following are the results of the July examinations of the Pharmaceutical Society of Ireland:—

PHARMACEUTICAL LICENCE EXAMINATION.—*Passed* (arranged according to merit): Julia Byrne, Denis F. McCarthy (Michael Fortune, Gerald O'Neill), Ellen Brennan (Winifred Colgan, M. J. Leahy, and Cornelius Dillane). Twenty-six candidates were rejected.

PRELIMINARY EXAMINATION.—*Passed* (arranged according to merit): Thomas Quigley, John O'Connell, Richard Daniel Arnold, Thomas Esmond, and Honoria Costello. Thirty candidates were rejected.

PHARMACEUTICAL ASSISTANT EXAMINATION.—*Passed* (arranged according to merit): Matthew J. McNamara, Annie R. Maguire, Maureen O'Halloran, Bartholomew Hickey, Eileen M. Young, Victor P. M. Good, Frances J. Roche, John F. Howard, Mary E. Galvin, Rose A. Reilly, Graham Wilkinson, Sean Leary, and Eva P. Wright. Five candidates were rejected.

REGISTERED DRUGGIST EXAMINATION.—*Passed* (arranged alphabetically): James Clune, George Hennessy, Patrick Joseph Mallon, Eileen Murphy, Pierce Power, Rose Reilly, and Graham Wilkinson.

"Kodak" as a Trade-mark

An inquiry was held recently in the Industrial and Commercial Property Office to adjudicate in the matter of the application of Kodak, Ltd., for registration of the word "Kodak" as a trade-mark. Mr. Maguire, who appeared for the applicants, said the word "Kodak" was invented many years ago, as the trade-mark applied to the products of Kodak, Ltd. He had a number of declarations on the matter, the first being by Sir Thomas Robinson, managing director of Hayes, Conyngham & Robinson, Ltd., chemists. It stated that he had forty years' experience and was familiar with photographic cameras and supplies, and he said that the word "Kodak" applied to cameras made by Kodak, Ltd., and not to those of any other company. Counsel also read a declaration from Mr. John Smith, chairman of the Dublin branch of the Photographic Dealers' Association, stating that "Kodak" meant cameras and appliances made by the Kodak, Ltd., to the exclusion of all others. Mr. Maguire further read a declaration by Mr. F. C. Madison, chairman of the Kodak, Ltd., Kingsway, London, stating that the word "Kodak" was invented by George Eastman. Having cited cases dealing with the matter, Mr. Maguire quoted from a number of dictionaries definitions of the word "Kodak." The Controller said a search in the office had failed to find any reference to the word "Kodak" before the year 1888, and that was the reason why he asked for the date of the invention of the word "Kodak." They succeeded in getting the registration because it was a freshly-invented word, and nobody appeared to know anything about it. Very shortly after that, and while the activities of the Eastman Company appeared to be very widespread—from 1895 to 1905 or 1910—very many authorities would appear to have adopted this word as an ordinary word in the English language. He found that Murray's English Dictionary referred to the word "Kodak" as the "art of kodaking." It was used as a journalistic term, and a certain newspaper said that "the President of the Transvaal had recently been kodaked by Labouchere." The Controller said he was satisfied from Mr. Maguire's arguments and from the declarations of Sir Thomas Robinson, Mr. Smith, and primarily that of Mr. Madison, that the word "Kodak" was indicative of the goods manufactured by the Kodak Co. In these circumstances he would allow registration.

Brevities

In the recent Omagh shopping week parade Mr. Herbert A. Kyle, Ph.C., Market Street, had on exhibition a gaily decorated Irish jaunting car displaying Ulster goods.

Mr. S. S. Badger, J.P., vice-president of the Pharmaceutical Society of Northern Ireland, was chairman of the organising committee of the Magherafelt shopping week, which was held during the week ended July 16.

It is understood that the new iodine factory in Galway will be in full working order shortly. It will be the first established in the Free State under the Government's scheme for the purchase and utilisation of kelp.

Mr. Desmond Whyte, the sixteen-years-old son of Councillor J. M. Whyte, Bangor, co. Down (governing director of Whyte, Reid & Mitchell, Ltd., manufacturing chemists, Belfast), swam out and rescued a man from drowning, at Ballyholme, recently. This is not the first time members of Mr. Whyte's family have performed rescue work of this nature, as some years ago another of his sons, Norman, assisted in a similar task, while his father and grandfather were involved in such life-saving operations on two occasions.

Belfast

Sir Thomas McMullan, who has been unwell for a considerable time past, has resumed business.

Mr. T. Bennett, Ph.C., has taken over the pharmacy of Mr. Hugh Crail, Ph.C., 579 Upper Newtownards Road, Belfast.

Mr. Jack Kells, son of Mr. Robert Kells, M.P.S.N.I., Albertbridge Road, has won a second-year scholarship value £80 in Queen's University, Belfast, and also the Porter Endowment, value £30.

Dublin

Kodak, Ltd., have acquired new premises in Rathmines.

A garden party was given by the Governor-General at the Vice-Regal Lodge on July 24 in honour of the visit to Ireland of the representatives of the International Parliamentary Conference. Among those who had the honour of being invited were the president of the Pharmaceutical Society of Ireland, Mr. Frank Fitzpatrick, P.C., and Mrs. Fitzpatrick.

North London Sports

THE annual sporting event of the North London Pharmaceutical Association and the North Metropolitan Branch of the Pharmaceutical Society is now several years old, and usually attracts around two hundred visitors. This year was no exception. An excellent programme was arranged for July 17 at the Barnet ground of S. Maw, Son & Sons, Ltd. The weather was at first fine and warm, but later on became cloudy. During the afternoon and evening music was provided by the Presto Dance Orchestra. During the tea interval Mr. D. Anderson (president) welcomed the visitors, and prizes were distributed to the following winners by Mrs. Young, wife of the vice-president:—*Golf* (mixed foursomes), Miss Parker and W. E. Swanston; *Tennis* (singles), Mr. Pryce, H. Mountford; *Putting* (mixed foursomes), Mrs. Swanston and W. Douglas; *Quoits*, S. A. Evans; *Clock golf*, Mrs. Jones, H. R. Nightingale; *Egg and spoon race*, Miss Tear; *Wheelbarrow race*, Mr. and Mrs. C. Elliott; *100 Yards handicap* (gents.), Mr. W. R. Elliott; *Four-legged race*, Miss Tecar and Messrs. Lake and Richards; *Sack race* (ladies), Mrs. Woodley; *Sack race* (gents.), H. Sprigg; *50 Yards handicap* (ladies), Miss Pinchen, Miss Mitchell; *Walking handicap* (gents.), J. W. King, W. Pinchen; *Cigarette race*, Miss Gale and Mr. Armstrong; *Musical arms* (ladies), Miss Loft; *Musical arms* (gents.), W. Lake; *Children's races*, Peggy Lowe, Heather Walker, Sybil Brown, Joan Brown, Marjorie Brown, Reggie Lowe, George Gibson, Alan Burney. The M.C. was Mr. Swanston, who was accorded a hearty vote of thanks for the admirable arrangements, as were also Messrs. Maw for the use of their ground.

Legal Reports

Cassia Oil Arbitration Dispute.—The Court of Appeal, consisting of Lords Justices Scrutton, Lawrence and Slesser, on July 17, heard an appeal by Mr. W. Naumann, as buyer of ten cases of cassia oil, from the judgment (*C. & D.*, April 12, p. 442) of a King's Bench Divisional Court, composed of Lords Justices Greer and Romer (sitting as additional judges of the King's Bench Division), refusing to set aside the award of Mr. W. C. Radermacher in an arbitration between Mr. Naumann and Edward Nathan & Co., Ltd., the sellers of the oil. Mr. Naumann's complaint was that Mr. Radermacher acted injudicially in not hearing evidence and in sending samples to an independent analyst, and accepting the report of the analyst without forming an opinion of his own. The Divisional Court held that as the parties had formally agreed to the arbitration which had taken place, and that having regard to the way the buyer had presented his case he had precluded himself from any right to complain. The motion to set aside the award was accordingly dismissed and against this decision Mr. Naumann now appealed. Mr. Clement Davies, K.C., for the appellant, said it was desirable to know in what way this umpire should act. The arbitration showed that the evidence before it was ignored. He submitted that a tribunal was not entitled to behave without some regard for the ordinary methods of justice and was not entitled to ignore the evidence before the arbitrator. In the present case the arbitrator acted contrary to natural justice. Proceeding, counsel said that the oil was purchased as ordinary natural cassia oil. When the goods arrived in December 1929 a sample was taken by the buyer and sent to an analyst, who reported that it contained artificial cinnamic aldehyde, and therefore was not a natural oil. The buyer claimed to reject, and arbitration followed. The arbitrator asked for another sample and sent it to a third analyst, who reported that the oil was of low specific gravity, but he could not find any chlorine or any traces of cinnamic aldehyde, and that the oil was of merchantable quality. The umpire issued his award on that report, and, counsel submitted, had been guilty of misconduct in so doing. Without calling upon counsel for the respondent the Court dismissed the appeal with costs. Lord Justice Scrutton, in giving judgment, said that during the last thirty or forty years the attitude of the Courts to commercial arbitration had considerably altered. Business men had arrived at the conclusion that it was better to have a rough and ready method of arriving at the truth rather than the more accurate and expensive and dilatory methods exercised in the Courts. The evidence was overwhelming that the usual way of conducting an arbitration in London was for the umpire to have his own independent analysis and have no further meeting or submit the evidence to either of the parties unless specially asked to do so. There was nothing in the present case which would lead the Court to say that what had been done was contrary to public policy. The buyer's arbitrator saw the umpire, and submitted the two analyses. He admitted that he was told by the umpire that a sample would be wanted, and he raised no objection. After that it was idle of the buyer to object. The evidence was overwhelming that that was the usual way of conducting these "quality" arbitrations. The appeal failed and would be dismissed with costs. Lords Justices Lawrence and Slesser concurred.

Unsuccessful Claim.—In the Mayor's City of London Court, on July 17, British Automatic Vendors, Ltd., 60 Holborn Viaduct, E.C., sued Mr. R. E. Parker, chemist and druggist, Hertford Road, Coventry, for the sum of £66 for two automatic vending machines supplied in October 1929. Mr. Lawrence Hughes, traveller for the plaintiffs, said that he called upon defendant in June last year, and he signed an order for a four-tier, eleven-compartment automatic machine. The terms were £5 deposit, and payment of the balance, £66, one month after delivery. The machines were delivered after the

defendant had had a demonstration at the plaintiffs' Birmingham showrooms, but payment was not made as arranged. Witness called upon defendant with the Birmingham sales manager in February 1930, and then Mr. Parker declared that he had never signed an order. He also made complaints that the machines had allowed rain to penetrate and spoil various packeted articles placed in the machines. Thereupon plaintiffs' Birmingham manager had offered to have them put in order. Cross-examined, witness denied that he gave the defendant an assurance that the machines were weather-proof and rust-proof, but said he did assert that they would reject spurious coins. He also agreed that by February the machines had become quite "stuck up" with rust and dirt, and said this was due to the failure of the defendant to apply a small amount of oil to the hinges, and to give them ordinary cleaning attention. Instead of one four-tier machine, the defendant accepted two two-tier, eleven-compartment machines. He also agreed that he promised Mr. Parker 5 per cent. commission on all machines which he (witness) sold in Coventry, but this was quite a private arrangement, and had nothing to do with his employers. Actually, no machines had since been sold in that city. Mr. W. H. Nightingale, plaintiffs' district manager in the Midlands, said that he saw Mr. Parker in February with Hughes. The defendant then denied that he ever signed an order, but later made complaints that the machines were not efficient. Other evidence was given that a mechanic was sent to defendant's shop and examined the machines, which later were sent to Sheffield for overhaul. The defendant, however, had refused to accept delivery, and had set up a counterclaim for commission from plaintiffs on the basis of the arrangement made privately with Hughes. Mr. Parker, giving evidence, said that Hughes assured him that the machines were rust-proof, weather-proof, and would reject spurious coins. Actually, between October and the end of the year they became rusted up, and allowed rain to penetrate and spoil the goods placed in the compartments. On a number of occasions he found foreign and worthless coins in the till, and customers had complained that they could not get the articles they required after putting in their money. He claimed to reject the machines on the ground that they were not as represented. Judge Shewell Cooper said he felt he must hold that the fact, which he accepted, that the machines were not rust-proof, or weather-proof, was such a serious matter that it constituted a condition of the contract. The defendant was therefore entitled to refuse to pay for them. Looked at in another way, as a breach of warranty, the breach was so serious that it made the things useless. On the whole, notwithstanding the lapse of time, the defendant was still entitled to say he would not have the machines. Judgment was accordingly given for the defendant, with costs, on the claim, and with regard to the counterclaim, which included the £5 deposit, by consent it was dismissed, with costs. His lordship remarked that the machines remained the property of the plaintiffs.

New Companies and Company News

P.C. means Private Company and **R.O.** Registered Office.

WESTERN SURGICAL APPLIANCE (LONGMATE'S PROCESS), Co., LTD. (P.C.)—Capital £2,000. Objects: To acquire the business of a surgical appliance manufacturer now carried on by W. Longmate; to manufacture such appliance by the use of a non-inflammable celluloid process which forms the principal part of the property acquired together with the sole right to use the designation "Longmate's." The directors are: C. A. Turner and W. Thompson. **R.O.**: 38 Bow Lane, E.C.4.

CHILEAN NITRATE PRODUCERS' ASSOCIATION (LONDON), LTD. (P.C.)—Nominal capital £10,000. Objects: To carry on the business of manufacturers, importers, exporters

and producers of and dealers in all kinds of ores, metals, minerals, chemicals and chemical products, etc. The subscribers are L. E. Grant and J. Stantic. Solicitors: Slaughter & May, 18 Austin Friars, E.C. The Chilean Nitrate Producers' Association (Overseas), Ltd., was registered as a "private" company on July 10, with a nominal capital of £5,000. The objects and other particulars are similar to those of Chilean Nitrate Producers' Association (London), Ltd.

RADIOGEN, LTD. (P.C.).—Capital £3,000. Objects: to enter into an agreement with the Allgemeine Radium Aktiengesellschaft, of Dorotheenstrasse 36, Berlin, N.W.7, for the purchase of the British trade mark "Radiogen" No. 303,064 and the right to carry on the business previously carried on by Radiogen Gesellschaft mit beschränkter Haftung, and to carry on the business of manufacturers of and dealers in products (whether in solid, liquid or gaseous form charged in a manner that will produce radioactive emanations), minerals, ores, chemicals, gases, drugs, etc. The directors are: G. Pearce and D. Bradfield. R.O.: 43 Parker Street, Kingsway, W.C.2.

GEE KAY PRODUCTS, LTD. (P.C.).—Capital £5,000. Objects: To acquire from F. E. Palmer certain formulas and the secret process of manufacture of (1) Gee Kay for the sterilisation of soil and seed before planting; (2) the formula of Gee Kay plant steriliser and its secret process of manufacture, being a preventive fertiliser for safeguarding growing plants against disease; and (3) the formula of Gee Kay potato steriliser and its secret process of manufacture for the treatment of potatoes before planting and for preventing disease in potatoes, etc. The permanent directors are: F. E. Palmer, D. Ogilvie, H. G. Henderson and A. G. Bishop. R.O.: 5 Camomile Street, E.C.3.

RUBBERINE-SYNLAC, LTD. (P.C.).—Capital £1,000. Objects: To adopt agreements (1) with S. H. Bersey as liquidator of Rubberine, Ltd., for the sale and purchase of certain assets of Rubberine, Ltd., and (2) with the said S. H. Bersey as liquidator of Synlac, Ltd., for the sale and purchase of certain assets of Synlac, Ltd., and to carry on the business of manufacturers of and dealers in rubber substitutes, rubber compounds and artificial rubber, shellac, artificial shellac, shellac compounds and shellac-like substances, etc. The directors are: J. Green, A. J. Hooper, Admiral Sir Reginald G. O. Tupper, and J. A. Witt. R.O.: 29A Offord Road, Caledonian Road, N.1.

GRAESSER-MONSANTO CHEMICAL WORKS, LTD., intimate that Mr. John F. Queeny, who returned recently to the United States, has resigned the chairmanship of the Graesser-Monsanto board. Mr. Queeny, who is chairman of the board of Monsanto Chemical Works, Incorporated, St. Louis, U.S.A., remains a director of Graesser-Monsanto, in which company he will continue to take an active interest. Mr. L. F. Nickell, who has been with the Monsanto Chemical Works, Inc., for fourteen years in charge of their works at Monsanto, Illinois, is appointed chairman and managing director of the Graesser-Monsanto Chemical Works, Ltd. Mr. T. P. Berington, secretary of the company, succeeds the late Mr. J. D. Gillis, as vice-chairman.

HEPPELS, LTD., report a deficit of £79,374 for the year to March 31, 1930, compared with a profit of £20,839 for 1928-29. In the Board's lengthy report it is stated that, with the exception of Mr. Frank A. Ringer, the present constitution of the Board is of recent date. At the time when the new directors took up office the position as to the balance due on sale of investments was as follows:—A substantial interest was acquired in 1926 in the preference share capital of the Société Anonyme des Drogueries d'Egypte. In August, 1927, the balance of that holding, 27,245 shares, was sold under agreement at £5 sterling per share, giving a total which should have been paid by March 15, 1928, of £136,225. 8,500 shares have been taken up at the contract price of £42,500, leaving 18,745 shares to be taken up of the value of £93,725. The company holds

18,039 shares, as 706 shares were short delivered at the outset, although paid for. The purchaser is liable for interest until completion. So far net interest has been charged to March 31, 1929—namely, £7,348. The total stands in the balance-sheet at £101,073. Legal proceedings, instituted by the company, are now in progress for specific performance of the contract by the purchaser. Meanwhile the company holds the shares, and has as further collateral security a first charge for an amount of £30,000 upon the leasehold premises, 16 Grosvenor Place. As to the items of "Preliminary expenses, £14,892" and "Underwriting, overriding and brokerage commissions, £13,083," these, together with "Deferred revenue expenditure, £603," have been included in the "Suspense account." The directors intend to deal with this amount of £28,579 in the near future. Arrangements are in hand to improve the financial position and discharge the obligations to creditors. The figure of £64,239 under the heading "Sundry creditors" has been reduced since March 31 by upwards of £40,000. The auditors state they are unable to form an opinion as to the value of the debt of £101,073 due to the company for sale of investments.

Bankruptcy Reports

Re Charles Brameld, 219 Holderness Road, Kingston-upon-Hull, chemist and druggist.—A deficiency of £1,309 6s. 7d. was disclosed in the statement of affairs presented at the first meeting of creditors held on July 11 at the Official Receiver's Office, 37 Scale Lane, Hull. The liabilities were stated to be £1,772 13s. 6d., with assets of £463 6s. 11d. The debtor attributed his failure to bad trade, heavy overhead charges, and excessive drawings from his business. Mr. A. W. Kilvington, York Chambers, Lowgate, Hull, was appointed to act as trustee. The following are creditors:—Brameld, Miss A., £240; The British Drug Houses, Ltd., £15; Carter, H. W., & Co., Ltd., £21; Chaplin, W. H., & Co., Ltd., £12; De Witt, E. C., & Co., Ltd., £20; Evans Sons Lescher & Webb, Ltd., £18; Gilbey, W. & A., Ltd., £137; Kennaway & Co., Ltd., £37; Lamb & Watt, Ltd., £22; Lofthouse & Saltmer, Ltd., £334; bankers, Hull, £646; Raimes & Co., Ltd., £16; Sayers, Silcox, Cuzner & Co., Ltd., £27.

Private Arrangements

Thomas Morgan Watkins, 25 Whitcombe Street, Aberdare, chemist and druggist.—At a recent meeting of the creditors the statement of affairs showed ranking liabilities of £425 1s. 2d., made up as follows:—Trade creditors, £170 6s. 8d.; cash creditors, £96 0s. 5d.; and partly secured creditors, £158 14s. 1d. The total claims of the latter were £453 17s. 8d., but securities valued at £294 17s. 7d. were held. In addition there was a fully secured creditor for £167 18s. 6d. The assets comprised stock at cost, £227 2s. 4d., estimated to realise £113 11s. 2d.; fittings and utensils, £17 5s.; book debts, £9 15s. 6d.; debtor's interest under will, £100; and cash in hand, £10 15s. 3d.; making a total of £251 6s. 11d., or a deficiency of £173 14s. 3d. It was reported that the debtor commenced trading in 1923, when he was allowed an overdraft of £200, which was guaranteed by a relative. He removed to his present address in May 1928. The fully secured creditors were a firm who held a charge on the lease and fixtures. The partly secured creditors held certain shares and a policy on the debtor's life. The cash creditor was the landlord who sold the business to the debtor, and the amount of the claim represented the balance outstanding. During the discussion the opinion was expressed that the business should be continued, and it was eventually decided that the meeting should be adjourned.

The Plymouth Co-operative Society report a quarterly turnover in the drug department amounting to £5,709, an increase of 16 per cent. compared with the corresponding quarter of 1929.

Pharmaceutical Society of Northern Ireland

Council Meeting

THE monthly meeting of the Council of the Pharmaceutical Society of Northern Ireland was held on July 18, in the offices, Belfast, the president, Mr. Fred Storey, in the chair. There were present also: Messrs. A. C. McBride, J.P., J. E. Connor, J.P., W. S. Taylor, R. I. Edwards, W. Martin and Dr. Fielden. Mr. D. L. Kirkpatrick (secretary) was in attendance.

Apologies were received from Sir Thomas McMullan, Dr. Acheson, Mr. S. S. Badger, J.P., Mr. H. Todd, Mr. J. F. Grimes, J.P., Professor Small, Mr. James Dundee, and Mr. John Maxwell.

Mr. H. S. Murray, Belfast, wrote resigning membership of the Society.

It was agreed to "house" the British Drug Houses Golf Cup, won by Northern Ireland, in the Society's headquarters during the coming year.

POISON-LICENCES

The secretary reported that the Londonderry County Council had issued four licences in Coleraine for the sale of agricultural and horticultural poisons to other than chemists, and he had taken the usual steps in the matter with the Home Office. Such licences had not been issued in that town before. A letter was read from a chemist in Coleraine protesting against the issue of these licences.

Mr. McBRIDE said that they were doing everything humanly possible to prevent these licences being granted, and had already had a number of licences cancelled.

The secretary's action in opposing the licences was approved; also his action in opposing similar licences in Omagh and Dungiven.

RECIPROCAL RELATIONS

The New Jersey Board of Pharmacy wrote that they would be pleased to consider entering into a reciprocal agreement with the Society if it could be established that their respective requirements for the licensure of pharmacists were equal in their scope and legal detail. They hoped to hear from the Society further on the subject, but at present they were of opinion there was a considerable difference between the regulations of the two bodies.

The letter was referred to the Education Committee.

EDUCATIONAL MATTERS

The Education Committee recommended that a number of persons who submitted certificates from other examining bodies be granted the certificate of apprentice to a pharmaceutical chemist.

The Committee appointed to inspect the chemistry laboratory in the Municipal Technical School, Londonderry, reported that all the necessary facilities and equipment required were available for the teaching of chemistry for the Final examination. It was resolved that this School be recognised for the teaching of Part II Chemistry.

It was resolved that the following conditions should govern the awarding of medals:—(1) The medal in each Part shall be awarded to the candidate who obtains the highest aggregate, provided that (a) the candidate obtains at first attempt not less than 75 per cent. of the possible total; (b) the candidate obtains not less than 60 per cent. in each subject; (c) the candidate obtains without adjustment not less than 50 per cent. in each section of each subject. (2) If more than one candidate in each Part fulfils the above conditions silver medals may be awarded to those who obtain second place.

It was agreed that the design of the medals be left to the president and secretary to decide.

Mr. CONNOR moved, and Mr. McBRIDE seconded, that the report be adopted. This was agreed to.

PROFESSOR SMALL ELECTED HONORARY MEMBER

The PRESIDENT moved: "That Professor Small, D.Sc. (Lond.), Ph.C. (Great Britain), F.L.S., M.R.I.A., F.R.S.E., be elected an honorary member of the Pharmaceutical Society of Northern Ireland."

Mr. STOREY said that Professor Small was a pharmaceutical chemist, and had obtained the high position of Professor of Botany in Queen's University. This was not his only accomplishment; he was a man of culture, an author of distinction whose books were standard works, and he had established a world-wide reputation as a botanist, and they were proud to know that he had risen to such heights. He had no doubt he would obtain still higher honours in the subject he had at heart. (Hear, hear.) For the last five years he had been a tower of strength to the Society, and gave his valuable time free and fully in their interests.



PROFESSOR JAMES SMALL

He was their representative on the B.P. Committee and on the B.P.C. Committee. He held a commission in the 4th Battalion Black Watch, and had a distinguished record in the late War. In honouring Professor Small they were honouring Queen's University, whose representative he was on their Council, and they were doing honour to themselves. They might look upon Professor Small's attainment as an epitome of his past and a forecast of his future. (Applause.)

Mr. McBRIDE, in seconding, said the Professor was an outstanding man and a gentleman. He had given them much advice for the benefit of the Society and of pharmacy in general. The honour was the highest they could confer on him, and it was a pleasure to them to be able to confer it.

Mr. CONNOR said they were fortunate in having such a man as Professor Small to look after the educational side of the work. He had represented them very ably at Queen's University, and the very fact that he was on the Council carried great weight with the British Society.

Dr. FIELDEN, as a Queen's colleague of Professor Small, heartily supported the motion, which was passed unanimously.

The secretary read the report of the Pharmaceutical Preliminary Examination from Queen's University. [The names of the successful candidates were published in the *C. & D.*, June 28, p. 777.] There were twelve candidates in all, seven of whom obtained the full matriculation.

MEMBERS ELECTED

On the motion of Mr. Edwards, the following nominated candidates were elected members of the Society:—

Joseph Anthony Moonan, The Pharmacy, Cushendall; Isaac Rowland Mackey, 33 Eglinton Street, Portrush; William John Thornton, Marine View, Newcastle, co. Down; Dwight Lionel Moody, 22 Bridge Street, Lisburn; John Dawson Fullerton, 262 Crumlin Road, Belfast; William George McCreight, 225 Newtownards Road, Belfast; Edward Boyd, 24 Albertbridge Road, Belfast; Thomas McDowell, 209 Shankill Road, Belfast; George Cheevers, Main Street, Keady; Herbert Edward McIlroy, 117 York Street, Belfast; James Stewart, The Medical Hall, Ballymoney.

OTHER BUSINESS

The PRESIDENT drew attention to the prosecution and conviction of a drug addict at Belfast for obtaining laudanum from a chemist. Chemists should be very careful, as all sorts of subterfuges were employed by drug addicts to get drugs. He thought that a word of warning to the trade would be advisable. If a chemist was in doubt he should notify the inspector.

The annual meeting was fixed for October 6 at the Chamber of Commerce.

Mr. McBride intimated that he would not be a candidate at the next election. He was grateful for all the kindness shown him at the Council, and he would treasure the fact that he had been president of the Society. It was purely owing to pressure of business he had to retire, and he wished the Society every success. He left it with great regret; he felt that if he could not attend regularly he should not be a member.

The PRESIDENT expressed regret at Mr. McBride's decision, and said they looked on Mr. McBride as one of the stalwarts of the Society. They all had a deep regard for him, and if they could persuade him to go on they would try and do it. He hoped Mr. McBride would go forward again for the benefit of the Society.

Mr. TAYLOR said he was in the same category. He had had six years on the Council and had decided to retire.

The PRESIDENT spoke in similar terms regarding Mr. Taylor.

Retail Pharmacists' Union

Executive Meetings

MEETINGS of the Executives of the Retail Pharmacists' Union and Chemists' Defence Association were held at 4-5 Queen Square, London, W.C.1, on July 15, Mr. H. H. Marshall in the chair.

SURGICAL SPIRITS

The following letter was received from the Board of Customs and Excise:—

SIR,

20th June, 1930.

The Commissioners of Customs and Excise direct me to inform you that they have recently had under reconsideration the question of "Surgical Spirits" prepared with Industrial Methylated Spirits in accordance with approved formulæ.

2. The three standard approved formulæ which the Commissioners understand were published in the "Pharmaceutical Journal" of the 14th July, 1928 [THE CHEMIST AND DRUGGIST, July 7, 1928, p. 15], viz.:—

No. 1.—Tannic Acid 1.1 per cent., Boric Acid 1.1 per cent. to Industrial Methylated Spirits 100;

No. 2.—Castor Oil 5 per cent. to Industrial Methylated Spirits 100; and

No. 3.—Boric Acid 1.1 per cent., Castor Oil 2.5 per cent. to Industrial Methylated Spirits 100.

3. The Commissioners, on reconsideration, are unable to regard the No. 1 formula as sufficiently nauseous for unrestricted sale, and they therefore contemplate the withdrawal of this formula from the approved formulæ for Surgical Spirits. Before taking this action, however, the Commissioners think it proper to inquire whether your Union wish to offer any observations, and whether they would take some steps to bring the decision to the notice of their members.

4. The Commissioners are prepared to continue formulæ Nos. 2 and 3, and they regard these as suitable for inclusion in the proposed Third Schedule to the new Methylated Spirits Regulations which are now in course of preparation. They would observe that under the new regulations it will be open to Medical Practitioners to prescribe a preparation according to No. 1 formula, or any other particular formula they may choose, or indeed to prescribe Industrial Methylated Spirits as such. It appears to them two standard formulæ known at present as "Surgical Spirits Nos. 2 and 3," will amply provide for the requirements of the public who may find it necessary to purchase such a preparation without a doctor's prescription.

5. I am to add that a similar letter is being addressed to the Pharmaceutical Society.

I am, Sir, Your obedient Servant,

(Sgd.) E. R. BERTENSHAW."

The Executive accepted the withdrawal of No. 1 Formula and undertook to bring the matter to the notice of the members.

ASPRO AUTOMATIC MACHINES

The secretary reported upon the negotiations which had taken place between himself and Gollin & Co. Proprietary, Ltd., and the Super Automatic Machine Co., Ltd. He stated that a workable arrangement had been concluded by which chemists would be able to cease using the machines without loss. Messrs. Gollin & Co. had, he said, shown a very earnest desire to assist chemists in their difficulty, and the Automatic Machine Co., Ltd., had also displayed a commendable reasonableness.

COMMITTEE UPON RESTRAINT OF TRADE

A report was received from the chairman upon the oral evidence which had been given by the secretary and himself before the Committee on Restraint of Trade.

FEE ON D.D.A. ITEMS IN THE TARIFF

A letter was received from the Ministry of Health accepting the suggestion made by the R.P.U. that the dispensing fee payable in respect of prescriptions for preparations specified in the Drug Tariff which were dispensed alone and to which the provisions of the D.D.A. regulations applied, should be increased to 5d. (C. & D., July 5, p. 24).

DISPENSING OF POOR LAW PRESCRIPTIONS, D.D.A.

The secretary reported that he had written to the Ministry of Health asking them to approach the Home Office and make arrangements whereby prescriptions issued by Medical Officers of Health which were to be retained by the public bodies employing these officers, should be subject to the same exemptions under the Dangerous Drugs Acts as were National Health Insurance prescriptions.

G.D.A. Matters

The secretary reported that of the eighteen cases outstanding since the last meeting of the directors, six had been settled as follows:—(1) Claim for eczema caused by hair lotion supplied by member, settled by payment of £200; (2) claim for cattle, which died after being dosed with husk remedy, settled by payment of £142 3s. 10d.; (3) claim for illness caused by liquid paraffin contaminated with camphor, settled by payment of £1 10s.; (4) claim for dog, which died after administration of worm capsule supplied by members, settled by payment of £3 16s.; (5) claim for damage to car caused by cycling errand boy, settled by payment of £1 17s. 6d.; (6) claim for injury to eyes caused by tin of chloride of lime exploding when opened, settled by payment of £7 2s. 6d. The remaining cases were still the subject of negotiations.

The secretary reported that twelve new cases had arisen during the month. The following cases had, however, been settled:—(1) Claim for damage to dress caused by member in trying to remove spots, settled by payment of £1 10s.; (2) claim for eardrum pierced during syringing, settled by payment of £19 3s. 6d.; (3) claim for dress spoiled by dye supplied by member, settled by payment of 10s. 6d.; (4) claim for damage to car caused by cycling errand boy, settled by payment of £3 5s. 10d.; (5) claim for coat damaged by new paint on member's shop front, settled by payment of 15s. The remaining cases were left in the hands of the secretary.

The secretary reported that a member had been summoned for selling camphorated oil deficient in camphor, but the summons had been withdrawn.

A member had been defended in respect of a summons for failing to comply with the Weekly Half-Holiday Order. A fine of 7s. 6d. had been imposed.

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THE CHAIRMAN'S ADDRESS

THE PROVINCE OF PHARMACY

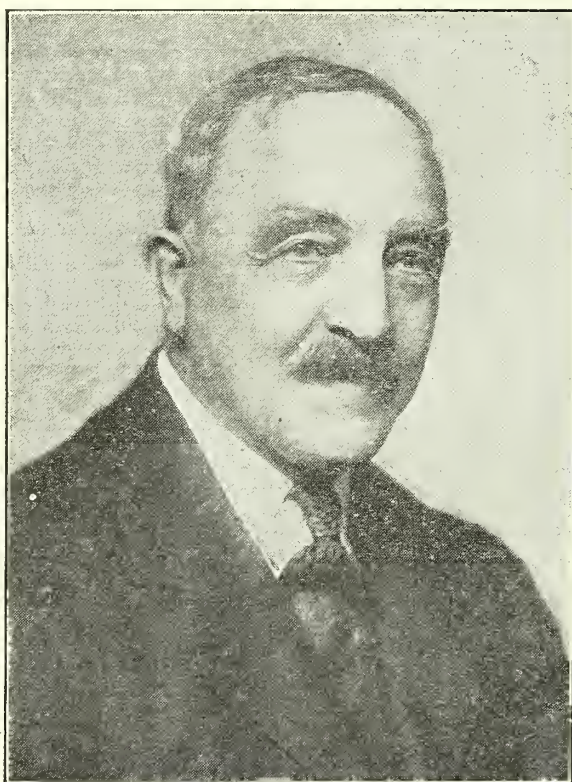
ONE of the questions which seem to require consideration at the present time is the exceedingly pertinent one: "What is the province of pharmacy?" Many would doubtless answer the question without hesitation, by furnishing a more or less unsatisfactory definition of the functions of the British pharmacist, and possibly endeavouring to convey the impression that the exercise of those functions corresponds in the main to carrying on the business of a chemist and druggist. But there is a vast difference between the practice of pharmacy, as it ought to be understood, and the business of a chemist and druggist as it has been carried on for many generations past. It is not to be denied, however, that some justification for confusion on this point is provided by the fact that this country is far behind the rest of Europe in the matter of recognising the professional nature of the pharmacist's functions, so far, indeed, that there is no exaggeration in asserting that the profession of pharmacy in this country is still in an early stage of development.

Looking back a hundred years, to the time when events were moving towards the formation of the Pharmaceutical Society of Great Britain, we find little that could properly be regarded as the practice of pharmacy as it is understood to-day, either in shops or institutions. The chief reason for this was the unwillingness of what now constitutes part of the medical profession to relinquish work for which it had ceased to be fitted. When the old-time apothecaries were content to compound and dispense medicines ordered by physicians for their patients, a system prevailed which approximated to the strict division between prescribing and dispensing that still rightly exists on the Continent of Europe generally. This distinction is so rigidly observed in some countries that medical practitioners who dispense are liable to serious penalties. But in this country the success which attended the efforts of the apothecaries to secure recognition as medical practitioners resulted in establishment of the now traditional system which involves a combination of prescribing and supplying medicines. The apothecary, who should logically have remained in the

position for which British pharmacists are now being trained, aspired to the practice of medicine and, not content with succeeding in the realisation of that aspiration, continued to supply the medicines he thought necessary for his patients, thus striving, as it were, to make the best of two worlds. His bad example in this respect largely permeated the medical profession generally, the physicians alone, as a rule, refraining from what they rightly regarded as unprofessional procedure. As for the rest, they considered that they had cut themselves adrift from the old shopkeeping traditions of the apothecaries by making no charge for the medicines they supplied. Even to-day the general practitioner will insist that he only charges for advice and not for medicine, just as the chemist and druggist charges for what he supplies and throws his advice in free. Cynics may suggest that, with such a state of affairs prevailing, patients and customers alike probably get just what they pay for, but in many instances the chemist's advice is worth immeasurably more than the doctor's medicine.

Before the Pharmaceutical Society was established there were shops where chemical substances manufactured on the premises were offered for sale, others where drugs of vegetable and animal origin

were obtainable, others, again, where spices and items classed as groceries were vended, and lastly the remaining establishments of the old apothecaries who combined in themselves the prescribing, compounding and dispensing of medicines. All of these appear to have contributed something towards the make-up of the chemist and druggist, in whose ancestry we can find undoubted traces of the apothecary, the operative chemist, the druggist and the grocer. In some instances one of these groups may appear to have been in the ascendant, and in other instances the dominant strain may have been quite different; but in the course of years a fairly homogeneous blend has emerged in the guise of retailers of chemicals and drugs, who also compounded and dispensed medicines when they had an opportunity of so doing.



Photo

[Elliot & Fry

MR. JOHN T. HUMPHREY, Ph.C., F.J.I.

Chairman of the British Pharmaceutical Conference, 1930

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ORIGINAL MEMBERS OF THE SOCIETY

Those who originally enrolled themselves as members of the Pharmaceutical Society were doubtless a very mixed lot of retail shopkeepers, with only a trace of professionalism attaching to a limited number of them. That their leaders were determined to alter this state of affairs is shown by their purpose of advancing chemistry and pharmacy being placed first in the Society's Charter among the objects for which the association had been formed. But membership was originally restricted to chemists and druggists established on their own account, so that it appears beyond question that the Society was constituted primarily in the interests of shopkeeping retailers of chemicals and drugs. Later we find the Pharmacy Act, 1852, confirming the Charter and restricting the title of "pharmaceutical chemist" to members of the Society and such persons as should subsequently become qualified by examination; in this Statute reference is made to the business or calling of pharmaceutical chemists, but there is no mention of the practice of pharmacy. Still later, the Pharmacy Act, 1868, limited the class of chemists and druggists to persons who had carried on business as such, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, and to assistants who had been registered as associates of the Pharmaceutical Society. Here we have the first reference in pharmaceutical legislation to a function which may properly be regarded as part at least of the practice of pharmacy. In the Apothecaries Act, 1815, there is a reference to "the trade or business of a chemist and druggist, in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicable compounds"; but this earlier recognition of chemists and druggists as compounders and dispensers of medicines preceded legal segregation of chemists and druggists into a class distinct from the rest of the community.

In the Pharmacy Act, 1868, we find a further reference to the business of the chemist and druggist, in connection with the retailing, dispensing or compounding of poisons; but nothing more respecting the practice of pharmacy, either direct or indirect. Incidentally, we may judge by inference from the wording of Section 26 of the Act, that the chemist and druggist was not regarded in 1868 as a maker or dealer in patent medicines, or as a wholesale dealer in poisons. So far, in fact, as the Charter and the Pharmacy Acts of 1852 and 1868 are concerned, the general business of the chemist and druggist is left undefined, recognition being accorded to him only as a retail dealer in poisons, and a compounder and dispenser of medicines ordered in medical prescriptions. But it is well known that the general business of chemists and druggists had been primarily the sale by retail of chemicals, drugs, spices, and other commodities. The nature of the business had naturally varied according to locality, and it is perhaps safe to assume that some of those who secured registration as chemists and druggists in 1868 could have had but little experience of the compounding of medicines ordered in the prescriptions of duly qualified medical practitioners.

NATURE OF THE CHEMIST'S BUSINESS

The important point, however, is that the chemist and druggist of early days made his living, and derived his title or business description, from the sale by retail of chemicals and drugs. Consequently, his successors have the first claim upon the retail business in those substances, whether sold entire or compounded in any way. Confirmation of this is furnished by the Medicine Stamp and Licence Acts, which go much further back than any Pharmacy Act, and grant special concessions to chemists and druggists in the matter of selling entire drugs and medicines compounded therefrom. This applies, of course, more particularly to the use as medicaments of drugs and substances of definite

chemical composition. Later developments, such as the use of chemicals in photography, the application of a variety of substances in the preparation of toilet requisites, or for domestic uses, or for use in agriculture, horticulture, and in manufactures, are obviously legitimate adjuncts of the business of the chemist and druggist, who is the only retail dealer trained both generally and particularly to possess an acquaintance with the properties of the substances he handles in the course of his business. This knowledge of materials is one of the most important advantages possessed by the properly trained chemist and druggist, giving him as it does an immeasurable superiority over all other traders as a vendor of chemicals, drugs, and products manufactured therefrom. Super-added to this, his special training fits him peculiarly for compounding and dispensing all substances required for use as medicines, whether ordered in the prescriptions of duly qualified medical practitioners, or called for in the ordinary course of retail business. The chemist and druggist, in fact, is the person singled out, by his peculiar knowledge and training, for the supply of all chemicals and drugs, whatever may be the purpose for which they are required.

It is the organisation of chemists and druggists in defence of their special interests which has led to the development in this country of pharmacy as a profession. Though there had been, from time to time, sporadic efforts in the direction of organising those engaged in the retail drug trade, nothing in the nature of a permanent and successful organisation resulted until the Pharmaceutical Society was established some ninety years ago. That success should have attended the efforts of its founders, and of those who came after them, was undoubtedly due to the adoption at the outset of an altruistic policy which has been, in the main, steadily adhered to ever since. Instead of setting to work on trade-union lines, and subordinating everything to endeavours to secure immediate improvement of the more material interests of those engaged in the retail drug trade, the chemists and druggists who first combined on a permanent basis seem to have been imbued with the idea that their own self-improvement would fit them better to serve the public, and that such a course would, in the fullness of time, be duly recognised and adequately rewarded. From the outset, therefore, we find the leaders of our craft pursuing the policy of offering the public more than they were receiving in return, and concerned mainly for the advancement of their calling on professional lines.

OBJECTS MENTIONED IN THE CHARTER

In the Royal Charter, which was obtained within two years of the formation of the Society, whilst the first object of its founders is stated to be the advancement of chemistry and pharmacy, the second is the promotion of a uniform system of education of those who practise the same; the protection of those who carry on the business of chemists and druggists is accorded third place only. There can be little doubt that it is close adherence to this programme which has enabled the Society to develop as a healthy, active organisation during the greater part of a century, without any suggestion of a set-back at any period of its existence. Its activities have resulted in the evolution of a profession of pharmacy in this country, and development of the practice of pharmacy from the purely trading operations which mainly constituted the original business of chemists and druggists. To such an extent has this been the case that it has been urged, as if in reproach, that the Pharmaceutical Society makes a point of educating as pharmacists those whom it can only register as chemists and druggists.

Whilst there is more than a grain of truth in this statement, no ground for blame attaches to it. The greater number of us necessarily engage in the same business as our predecessors. But we have carried on that business with a difference, to the benefit of the British public, thanks to the steady persistence with

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which the Society's policy of advancing pharmacy and promoting a uniform system of education of those who practise it has been maintained for generations past. With the lapse of time, we have found that the foresight of our predecessors was fully justified, and it is remarkable how modern developments are bringing us back in certain respects to acceptance of their views regarding the planning of the future of pharmacy as a professional occupation. They would have had all chemists and druggists enrolled as members of the Pharmaceutical Society, and so made eligible for registration as pharmaceutical chemists. To-day we are probably within measurable distance of witnessing the accomplishment of the former object, and it may then be only a matter of time before registration on the desired basis follows.

SIGNIFICANCE OF TITLES

It is to be remembered that there were two titles reserved by the Pharmacy Act, 1852, those of "pharmaceutical chemist" and "pharmaceutist." Non-members of the Society in business as retail vendors of chemicals and drugs were still known as chemists and druggists, but no provision existed for registering them as such, and there was nothing to prevent anyone from using the description "chemist and druggist" as a business designation. So matters remained until 1868, when conflicting interests clashed in Parliament and it was ultimately decided to be expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, and compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business, and to that end should henceforth be duly registered. In other words, the needs of the public in the direction of being properly safeguarded against misuse of poisons facilitated legal recognition of chemists and druggists as an important class in the community, as well as reservation of their peculiar business designations to the recognised members of that class. When disposed to gird at the mixing up of pharmacy and poisons legislation, we ought not to overlook the fact that it is to the urgency of the latter we owe such legal recognition of our position and privileges as now exists.

One illogical prohibition in the Pharmacy Act, 1868, was that of the use of the title "pharmacist" by chemists and druggists. The title was there reserved to pharmaceutical chemists, and it was not until 1908 that the right to use this generic term was extended to all registered chemists. Most of the pharmacists in Great Britain were, therefore, precluded from describing themselves as such for a period of forty years—forty years in the wilderness of non-recognition! Apart from this, it is of interest to note that this reference in the Act of 1868 appears to be the first official mention of the title "pharmacist," which was probably a corruption of "pharmaceutist," a term in use as a synonym for "apothecary," as far back as 1827 at least. Obviously "pharmaceutist" is a much less convenient term than its abbreviated form, and the latter just as obviously suggests itself as the natural description for the person who practises pharmacy. Since 1908 it has been legally applicable in this way, and our only regret need be that there exists a perverse tendency to misuse it as though "pharmacist" were synonymous with "chemist and druggist," and as if "pharmacy" meant the same thing as the business of the chemist and druggist. It is in no carping spirit that exception is taken to the all-too-frequent misuse of the title, "pharmacist," by prefixing it with inappropriate qualifying terms, but because the tendency is mischievous, since it encourages the idea that the practice of pharmacy is as much a trade as ever was the business of a chemist and druggist, and so minimises the importance of our hard-won professional status.

Realisation of the difference between the profession of pharmacy and the trade of the chemist and druggist provides the best remedy for confused thinking on the

subject, and should help to eradicate the bad habit of describing the pharmacist in general practice as a "retail pharmacist." Such a description savours of a contradiction in terms, is offensively inaccurate, and cannot be justified. Whilst the profession and the trade are closely interlinked, and may always remain so, that does not excuse application of our professional title as a mere trade description. Carelessness in the use of the description "chemist and druggist" may have counted for more than is generally assumed in enabling others than duly registered persons to establish a claim to it, and it would be deplorable in the extreme if similar lack of care were to result in the loss of our exclusive right to the title "pharmacist." Privileges that are lightly guarded tend to slip away, and it would be a thousand pities if rights and privileges gained as the result of the uplifting policy of the Pharmaceutical Society were to be needlessly sacrificed for lack of a little forethought by any of those who have benefited by the pains taken to safeguard our professional interests.

SOME FORECASTS

There must be general agreement that the development of the Pharmaceutical Society's educational scheme until the requirements for registration have attained their present pitch was not called for by the needs of the chemist and druggist as a trader. The old-fashioned "Minor" examination of pre-war days provided more than sufficient safeguard for the public, so far as the mere sale of chemicals and drugs, and the business in poisons, were concerned. But developments in the compounding and dispensing of medicines, with demands for adequate knowledge of all that is requisite in modern prophylactic and curative treatment, has rendered it necessary to extend widely the bounds of the pharmaceutical curriculum. So much so that the Society's examination syllabus now closely corresponds to that of the universities in their requirements for degrees in science. Moreover, the trend of things is in the direction of making the requirements for a pharmaceutical diploma still more closely approximate to those of the universities. We may expect to see the standard of our preliminary examination raised ere long to that of the university matriculation test. This, followed by the passing of an intermediate examination in pure science, will place successful students in a position to sit for a university degree, as an alternative or an addition to the pharmaceutical diploma. But such a raising of our standard of legal qualification must necessarily be held to imply that the province of pharmacy is much wider than that of a mere trader.

What appears likely to happen in the not far distant future is that qualification and registration as a pharmacist will involve training equivalent to that of the holder of a science degree, *plus* the extra practical training gained during an apprenticeship. After qualification the pharmacist will have a choice of occupations, though he will be more likely than not to become, as at present, a retail dealer in chemicals, drugs and pharmaceutical products generally, coupled with the compounding and dispensing of medicines. He may, however, prefer to interest himself in the manufacture and wholesale distribution of the same classes of goods. There should always be a pharmacist in charge of any factory or department where pharmaceutical products are manufactured, and there may often be need for more than one in such a place. Then, a certain number will always find occupation as hospital pharmacists or dispensers, and this number ought to increase as time goes on. Such posts should be regarded as "key" positions in pharmacy, since the hospital pharmacist has unlimited opportunities of exerting influence in the direction of rationalising the prescribing, compounding and dispensing of medicines. Other pharmacists will become engaged in the analysis of foods and drugs, work for which the highly-trained pharmacist is peculiarly suitable. But it seems needless to particularise further respecting the direction in which pharmacists may find congenial occupation, so long as

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we grasp the fundamental idea that the training of the future pharmacist must be on wide and general lines, leaving him to develop as a specialist in due course. Such development is more likely to happen after he has made a start in retail business than not, and it must be remembered that specialisation is so frequently compatible with carrying on the business of a chemist and druggist that our chief concern will probably always be the man behind the counter.

ADDITIONAL SUBJECTS OF STUDY

In order that the utmost advantage may be reaped from the expansion of our curriculum, the inclusion of biology and physiology in the intermediate examination suggests itself. The syllabus in these subjects should cover sufficient to fit holders of the pharmaceutical diploma better for dealing intelligently with animal products used in medicine—with serums, vaccines, antitoxins, and so forth. Some knowledge of biology and physiology would be useful to all pharmacists, and not least to those who decide to earn their living behind the counter. It would serve as a foundation on which to erect a competent knowledge of pharmacology, such as could not fail to commend the pharmacist to medical practitioners in search of new and suitable remedies. Many pharmacists even now make themselves conversant with the properties and actions of drugs, and a more systematic study of pharmacology should be encouraged. For generations past we have, under official guidance, made it our business to know everything about drugs except how they act and on what particular constituents their specific pharmacological actions depend. It has been quite wrongly assumed that we were debarred from the study of pharmacology by the words of Section 8 of the Pharmacy Act, 1852, which provides that the examinations of the Pharmaceutical Society shall not include the theory and practice of medicine; but there is really not the slightest reason for limiting our knowledge of drugs as has in the past been customary.

Another reason why biology and physiology should be included in the pharmaceutical curriculum is the increasing tendency to resort to physiological standardisation of drugs and their preparations, when they cannot be assayed by chemical means. Even though the pharmacist engaged in retail business should not have any occasion to undertake biological assays, he ought to know how they are done, and be able to explain to others their why and wherefore. How otherwise shall he be in a position to talk understandingly about the different actions of the alkaloids and amines in ergot, or the methods of determining the vitamin potency of various preparations in common use, or the virtues of the constituents upon which depend the activity of such drugs as digitalis, strophanthus and squill?

There is still another reason for our taking up the study of physiology, apart from the fact that knowledge of the subject is good for any man or woman, and that is the specially advantageous position in which such knowledge places us when dealing with the subject of dietetics. A practical acquaintance with nutritional requirements enables a pharmacist to act as a specialist in the supply of prepared foods for infants and invalids—in advising what should be used or avoided, and why. If conversant with the part played in the diet by proteins, fat, carbohydrates, vitamins and mineral substances, he is able to speak with authority concerning the food products that he may have occasion to supply, to explain why desired results cannot be obtained by means which are contra-indicated, and to advise what course should be pursued in order to attain the end desired. It will probably be found even more profitable to apply a sound knowledge of physiology in this way than to add some new side-line to one's business. That is why inclusion of the suggested extra subjects in the intermediate examination is recommended. In one direction or another it should go far towards providing pharmacists with the means of acquiring specialised knowledge that would bring more grist to the financial mill, whilst they are engaged in the regular business

of a chemist and druggist. Since that business may be expected to continue to absorb the majority of those who undergo the pharmaceutical training and become registered, the great need of the moment is to justify the high standard of qualification by showing how, in the words of the Departmental Committee on the Poisons and Pharmacy Acts, the profession of pharmacy can be made to "hold out sufficient hopes of reward to ensure a high standard of training and efficiency in its members." It is noteworthy that the Committee, while suggesting the imposition of further additions to our responsibilities, refrains from indicating how we are to realise hopes of sufficient reward.

THE NORMAL REQUIREMENTS

Except for making the suggested addition to the intermediate examination, and including a knowledge of the action of drugs in the final qualifying examinations, there does not appear to be any good reason for adding further to the number of subjects with which pharmaceutical candidates must make themselves conversant. So long as two distinct qualifying examinations remain, the one being regarded as the final test of the scientific and technical knowledge of those who propose to devote themselves to shop work, the only further training or instruction those particular candidates may need will be such as will fit them better for service as salesmen. A suitable intensive course of instruction in salesmanship should be available after the completion of the pharmaceutical curriculum; it need not occupy more than a few weeks of spare time, and its cost should speedily be recovered in the shape of higher remuneration than would otherwise be obtainable at the outset of one's career as a fully fledged chemist and druggist.

It may be that we are at present attaching undue importance to botany as a subject of the pharmaceutical curriculum, and that the syllabus in this subject might profitably be adjusted so as to allow for inclusion of matter of greater practical importance, such as biology and physiology, the potential value of which has previously been stressed. Years ago a knowledge of botany was required of medical students, but the need of it proved to be non-existent in their case, and it seems just possible that the knowledge of botany nowadays demanded on the part of pharmaceutical students is far in advance of their needs or of what the practice of pharmacy requires.

Additional subjects have been suggested for the higher qualifying examination, and an idea prevails that candidates should, up to a point, have the choice of alternative subjects, their choice to be dependent upon the direction in which they intend to specialise after qualification. A preferable plan, however, would appear to be the holding of an examination in fixed subjects with all of which every pharmaceutical chemist ought to be familiar, and then providing for those who wish to specialise by encouraging them to take post-graduate honours courses in particular subjects, with honours examinations to follow those courses. The passing of the final examination would place the candidate on a level with those who take an ordinary degree in science, whilst the distinction attaching to success in one of the post-graduate courses would be equivalent to taking an honours degree in science.

TWO EXAMINATIONS MAY BE BLENDED

It is perhaps not unreasonable to assume that, with the lapse of time, the two qualifying examinations in pharmacy will become blended in one, and that everyone who satisfies that test will be registered as a pharmaceutical chemist. All pharmacists would then undergo the same general training, and they would all constitute one class up to the point of qualification as pharmaceutical chemists. Specialisation would follow according to individual predilections, provision being made for any pharmacist embarking upon such particular occupation as might commend itself to him, and for which he was fitted by the training undergone. As previously

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suggested, the great majority would almost certainly rest content as at present with adopting the occupation of a general pharmaceutical practitioner, corresponding to that of the general medical practitioner. This general practitioner, in our case, would be the pharmacist who decided to serve the public behind the counter, combining the old-time business of a chemist and druggist, the compounding and dispensing of medicines, and such other functions as the needs of the particular environment called for. He might, very appropriately, be designated a general pharmacist, so as to distinguish him from pharmacists in hospitals and laboratories, or otherwise engaged in specialised work. With his practical knowledge of pharmacology, his advice should be welcomed by prescribers, and his acquaintance with dietetics should increase the value of his services to a large proportion of his customers, particularly mothers and nurses.

An important point, not to be overlooked, is that what may be regarded as the natural expansion of the province of pharmacy ought to provide sufficient occupation for as many persons as are at present qualified as pharmacists, and possibly for more. This suggests itself as a desirable alternative to the gradual extinction which seems our probable fate if we relax our grasp on the business of the chemist and druggist, and find no salvation except in the case of the few who may endeavour to adapt themselves for specialised work as "handmaids of medicine." Many years ago, the late Barnard S. Proctor, in a pessimistic mood, asserted that it would be an advantage if there were in future only one pharmacist where in his day there were two! But we have increased largely in numbers since then, and there are now more than 22,000 chemists on our registers. As there are only about 10,000 chemists' shops in Great Britain, it has been hastily assumed that we are overcrowded, the more especially since it has further been rashly assumed that more than half of the existing chemists' shops are superfluous. But consideration must be given to the fact that much which it would be an unmixed advantage for the British public to obtain from chemists and druggists is now supplied by doctors, unqualified keepers of drug stores, grocers, and small general shopkeepers.

THE PHARMACIST'S LEGITIMATE PROVINCE

No medical practitioner ought to compound and dispense medicines, or supply surgical requisites, except in cases of emergency; but the drugs and appliances supplied by doctors to their patients would constitute a considerable addition to the chemists' turnover. Medicaments sold by unqualified traders should also be replaced by chemists' supplies, if only because it is undesirable in the public interest that articles not complying with official standards should be used for medicinal purposes. It is perhaps best not to dwell upon the quality, or lack of quality, of drugs sold by others than chemists and druggists; it should suffice to state that they are probably more often deficient in activity than fit to use. A further point to be remembered, when trying to arrive at an estimate of the business that should rightly be diverted to the chemist and druggist, is the fact that there are some 90,000 holders of patent medicine licences in Great Britain. Of these, probably 80,000 are not chemists and druggists, and it seems safe to assume that, in addition to selling stamped medicines, these unqualified licence-holders deal in many articles which properly come within the scope of the chemist's business.

Then there are photographic supplies, toilet accessories, agricultural and horticultural requisites, all falling within the category of articles that the chemist and druggist is, by his special training, the person best fitted to supply to the public. It may be that he needs to awaken to the fact of the amount of business which ought to increase his turnover, but is being allowed to drift in other directions. Much of it could be captured by steady application, increased publicity, and a more imaginative outlook. Individual effort can be depended upon to accomplish much in the direction of convincing the public that the chemist and druggist is the proper

source of supply of all chemical substances, drugs and medicines, sick-room requisites, infants' and invalids' foods, and of the numerous side-lines which he can, if he will, demonstrate as well and supply on as favourable terms as anyone. Co-operation among chemists and druggists, and combined action in pushing their claims to public support, will carry matters much farther. But the great prerequisite is that everyone concerned should realise how extensive is the province of pharmacy. Let it be understood and emphasised that it includes everything needed in preventive and curative treatment, in health as well as in disease; all applications of chemistry in ways that come reasonably within the scope of a retail shopkeeper; the possession of knowledge that will enable the holders to render special service to medical practitioners and to customers who need something more than the mere handing over of goods purchased.

If only the British pharmacist will strive unceasingly to come into his own and reign supreme within his extensive province, there need be no more talk in our time about overcrowding or an excessive number of chemists' shops, nor any necessity for taking steps to make entrance to the pharmaceutical business more difficult. But he must awaken and be continually on the alert, and take care that those who represent him in any official capacity are at all times capable of taking the broadest possible view of the extent of the province of pharmacy. We need to be as persistent as the medical profession has been, steadily working towards the goal to which we know it will profit the British public that pharmacists should ultimately attain. Instead of anticipating and prematurely deploring total or partial extinction of the chemist and druggist, let us realise that the public needs him, and then let us determine to do everything in our power to assist in his further development as the general pharmacist, who shall be all that the chemist and druggist has been in the past and more, with a magnified province of pharmacy as his realm.

Westminster Wisdom

Notes on Parliamentary Matters.

DAINGEROUS DRUGS

The Home Secretary (Mr. Clynes) informed Lieut.-Colonel Fremantle on July 17 that it had not yet been possible to convene the proposed preliminary conference of countries manufacturing narcotics with a view to limitation of their output, since the preparatory work is not yet completed.

Mr. Marley asked the Home Secretary on July 17 if he will take action against doctors who leave drugs in open cars and fine them when that takes place.

Mr. Clynes: Steps have been taken in regard to that matter.

POISONS FROM AUTOMATIC MACHINES

Dr. Morris-Jones asked the Home Secretary on July 17 whether he was aware that drugs of a poisonous character can be procured from automatic machines outside chemists' establishments in the county of London; and whether, in view of the Poisons and Pharmacy Act, 1908, and the danger involved to the public, he will cause any such vendors to be prosecuted.

Mr. Clynes: I have seen in the Press the report of a case in which the legality of such sales was raised, and the Judge decided that they involved a breach of Section 3 of the Poisons and Pharmacy Act, 1908. The proceedings for the recovery of a penalty under that Section are of a civil character and are instituted by the Registrar of the Pharmaceutical Society, and I have no power to intervene. I understand the case in question was arranged by the Pharmaceutical Society for the purpose of testing the legality of such sales, and the judgment will, no doubt, be taken note of by those concerned.

Trade Notes

PROLIFERASE is a yeast preparation which is being introduced to the medical profession by the Anglo-French Drug Co., Ltd., 238A Gray's Inn Road, London, W.C.1.

WRIGHT, LAYMAN & UMNEY, LTD., 44 Southwark Street, London, S.E.1, are conducting a photographic competition in connection with their coal tar soap. A supply of leaflets similar to the advertisement which appears in this issue will be sent to chemists on request.

THE DUNHILL FOUNTAIN SHAVING BRUSH, manufactured by Alfred Dunhill, Ltd., 30 Duke Street, London, S.W.1, is an extremely practical novelty which is designed to reduce to a minimum the trouble incident on shaving, by automatically supplying, when required, the necessary amount of soap to the brush by a mere turn of a knob. As will be seen from the accompanying illustration, the Fountain shaving brush is built on conventional lines, with this important distinction, that a specially constructed cartridge containing shaving cream



fits into the hollow handle. The mode of operation is extremely simple: Moisten the bristles thoroughly with water, then give the knob on the base of the handle a complete turn, whereby a sufficient amount of cream is propelled into the brush, and now work up lather on face. After use it may be rinsed in the same way as any ordinary shaving brush. On the average, the cartridge of shaving cream requires renewal about every five weeks; the fitting of a refill cartridge is a matter of a few moments only. The mechanism is extremely simple and there is nothing to get out of order. The Fountain shaving brush, which is supplied in a convenient celluloid case for travelling, should prove a particularly acceptable gift.

SANITARY TOWELS.—Robinson & Sons, Ltd., Chesterfield, have supplemented their range of sanitary towels by the introduction of another line, Unlooped Sucan Soluble, which are packed to retail at a popular price. This product taps an entirely new market, and, it is claimed, should result in additional business for chemists.

PRICE REDUCTION.—Pond's Extract Co., 103 St. John Street, London, E.C.1, elsewhere in this issue, announce reductions in the prices of the two larger sizes of their Skin Freshener, to take effect on August 1. The firm consider that in many districts almost every customer for Pond's cold cream and vanishing cream can be induced to purchase the Skin Freshener and Cleansing Tissues regularly at the new prices.

ANNUAL HOLIDAYS.—Buckley-Bowker Tablet Co., Ltd., manufacturing chemists, 29 Parkfield Street and Berners Road, London, N.1, inform us that their works will be closed from August 2 to 9 inclusive. A small staff will be retained to deal with urgent orders.—Thomas Morson & Son, Ltd., manufacturing chemists, Gray's Inn Road, London, W.C., announce that their works will be closed from August 1 until August 11, during which period only urgent orders can be dealt with.

HARYSTOR.—Medicus, Ltd., 92 Southbridge Road, Croydon, are using the front page of the "Daily Mail" on August 15 to draw the attention of the public to their hair-restoring preparation named Harystor. The advertising campaign is intended to be of an educational nature with the object of inducing prospective purchasers to think of hair culture daily over a period of months. It is suggested that chemists should use their influence in this direction and so secure repeat sales. A special stocking-up offer is available until August 9.

THE DEPARTMENT OF OVERSEAS TRADE, 35 Old Queen Street, London, S.W.1, urges manufacturers to book their space for the 1931 British Industries Fair, which will be held at Olympia, London, W., and Castle Bromwich, Birmingham, from February 16 to 27.

JOHNSONS' LYSOL.—Johnson & Sons, Manufacturing Chemists, Ltd., Hendon, London, N.W.4, have brought out a series of showcards to advertise their lysol. Each card relates to a particular week, e.g., Happiness Week, Hygiene Week, Lysol Week, the idea being that the chemist should change the card each week and at the same time display for free distribution on his counter some of the small replicas in the form of handbills. The wordings are such as to draw the attention of the public to the advantages to be gained by the regular use of lysol.

STAFFORD ALLEN & SONS, LTD., manufacturing chemists and essential oil distillers, Cowper Street, Finsbury, London, E.C.2, commend for perusal by the wholesale trade the July edition of the company's export price list, and state that owing to the support of their overseas' customers they have been able to keep the factory running at full pressure, though many manufacturers were compelled to restrict production during the first half of the year. During the present trade depression this fact is added proof of the thorough reliability of their products.

B.D.H. MEDICINAL PRODUCTS.—We have frequently referred in this column to the valuable descriptive leaflets issued by the British Drug Houses, Ltd., Graham Street, City Road, London, N.1, regarding their medicinal products. The company has now issued in booklet form a *résumé* of the information contained in these publications, and a copy will be sent to any chemist who writes for one. The particulars given include the more important properties of the preparations, the conditions in which they are indicated, the technique of administration, modes of issue and prices.

Trade-Mark Applications

The figures in parentheses refer to the classes in which the marks are grouped. A list of classes and particulars as to registration are given in "The Chemist and Druggist Diary," 1930, p. 341.

(From "The Trade Marks Journal," July 2, 1930.)

"ZEROSOL"; for a chemical water softener (1). By Lime-Free Water and General Services, Ltd., 20 John Street, Adelphi, London, W.C.2. 512,886.

"RAYFERT"; for agricultural chemicals (2). By J. Hodgson Old Castle Buildings, 26 Preesons Row, Liverpool. 501,730.

"PYRADOL"; for insecticides (2). By W. J. Craven & Co. Ltd., 48 & 50 Port Street, Evesham. 512,730.

"KILSECTOL"; for agricultural chemicals (2). By W. & F. Walker, Ltd., Colonial House, Water Street, Liverpool. 512,993.

"KORMEOL TRADE MARK PRONOUNCE KOR-ME-OL" on a scroll design; for rheumatism medicine (3). By The Temple Pharmacy, Ltd., 22 Devereux Court, Temple, London, W.C.2. 510,183.

Eastern characters meaning "Hair Clouds Wonderful Water"; for liquid medicines (3). By Atsumori Tamenaga, 28 Aza Matsu bara, Matsuzawa-mura, Ebaragun, Tokyo Prefecture, Japan. 511,477.

"GRIMSBY PURE FRESH COD LIVER OIL EMULSION" with label design incorporating name and address of maker; for medicinal cod-liver oil emulsion (3). By Fairbank Kirby (Grimsby), Ltd., 385 Cleethorpe Road, New Clew, Grimsby. B500,506.

"RECESSO H.R.T." on blocked tile; for goods (16). By The Henry Richards Tile Co., Ltd., Pinnock Works, Woodland Street, Tunstall, Stoke-on-Trent. B512,334.

"B.B.B." in triangle design incorporating picture of a cock ("B.B.B." disclaimed); for cream of tartar substitute (42). By J. H. Rayner & Co., Ltd., 11 Old Hall Street, Liverpool. 510,753.

Marriages

PRICE-BISSELL.—At St. Michael's and All Angels', Westcliff-on-Sea, on July 16, by the Rev. M. Peters, M.A., vicar, Edward Raymond Price, M.P.S., of Lee, London, S.E., and Mellin & Co., chemists, Eltham, S.E., only son of Mr. E. G. Price, Ph.C., F.S.M.C., Lewisham, S.E., and Orpington, to Norah Constance, youngest daughter of the late Mr. T. J. Bissell, Westcliff-on-Sea.

ROBINSON-SEGERMAN.—At Middlesbrough, on July 2, Stanley Zalig Robinson, chemist and druggist, son of the late Mr. D. Robinson, 62 Camp Road, Leeds, to Hannah Betty, eldest daughter of Mr. M. Segerman, Rhodesia House, Southfield Road, Middlesbrough.

Deaths

FLETCHER.—Suddenly, at his home in Southport, on July 14, Robert Fletcher. Mr. Fletcher had been porter with the late Mr. J. R. Cave and with J. R. Cave (1922), Ltd., manufacturing chemists, for some forty years. He was well known to many chemists throughout the country as "Bob."

HILDYARD.—At Gorleston, on July 7, Mr. William Hildyard, chemist and druggist, aged seventy-two.

KERSHAW.—At his residence, Zealands, Riddlesden, Keighley, on July 7, Mr. Arthur Noble Kershaw, chemist and druggist, aged seventy-two. Mr. Kershaw took up the manufacture of mineral waters soon after commencing in business, and was the first chemist in the town to adopt photographic supplies as a side-line. He was a founder of the Keighley and District Chemists' Association and a member of two Masonic lodges. Mr. Kershaw is survived by two sons and three daughters.

MORGAN.—At King's Heath, Birmingham, on July 6, Mr. Albert Hall Morgan, chemist and druggist, aged seventy-seven.

POUSTIE.—At Devon House, Galashiels, on July 16, James H. Poustie, chemist and druggist. The funeral took place on Friday, July 18.

SPEARING.—At South Hackney, London, E., on July 13, Mr. James Spearing, Ph.C., aged eighty-nine.

PICKERING.—At Scunthorpe, on July 15, Samuel Drew Pickering, chemist and druggist, aged fifty-three.

TIGHE.—At "The Nest," Pennsylvania, Exeter, recently, Mrs. Wynne Tighe, widow of Mr. J. Wynne Tighe, who for many years carried on business as a chemist in High Street. Mrs. Tighe leaves two sons, who are in the business.

Wills

MR. WILLIAM MARTIN, Ph.C., of 7 Archers Road, Southampton, who died on December 27 last, left estate of the gross value of £48,165 2s. 4d., with net personalty £24,224 14s. 9d.

MR. JOHN FOSTER, of Hillside, Bardowie, Stirlingshire, chemist and druggist, of 479 Sauchiehall Street, Glasgow, who died on April 26 last, aged seventy-six, left personal estate of the value of £6,082 4s. 6d.

MR. WILLIAM MONTFORD JAMES, Ph.C., of 14 Market Place, Wednesbury, Staffs., manager of the Wednesbury Branch of Boots, Ltd., left estate of the gross value of £782 7s. 7d., with net personalty £753 6s. 7d.

MR. CHARLES GORDON McLELLAN, of Medwyn, Glenfarg, Perthshire, formerly of Glasgow, retired manufacturing chemist, who died on September 5 last, left personal estate in Great Britain valued at £7,732 13s.

MR. GEORGE SWINNERTON, of 5 Broad Street, Modbury, Devon, chemist and druggist, who died on Janu-

ary 28 last, aged forty-nine, left estate of the gross value of £872 17s. 1d., with net personalty £32 0s. 6d.

MR. SYDNEY GEORGE BAKER, of 16 Church Street, Greenwich, S.E., chemist and druggist, who died on April 18 last, aged 69, left estate of the gross value of £2,525 12s. 9d., with net personalty £1,316 12s. 4d.

MR. JOHN DUNCANSON HODGSON, of 223 Lower Clapton Road, Clapton, E.5, chemist and druggist, who died on May 8 last, aged sixty-five years, left estate of the gross value of £5,467 6s. 8d., with net personalty £3,840 2s.

MR. WILLIAM RUFUS CREASY, of Billingham, Lincs., chemist and druggist, formerly in business at Byfleet, Surrey, who died on September 11 last, aged fifty-two, left £1,490 3s. 3d. gross, with net personalty £756 19s. 9d.

Business Changes

MR. T. JAMES, chemist and druggist, has opened a pharmacy in The Square, Aberdovey.

THORNBERS (CHEMISTS), LTD., chemists, Accrington, have taken over the business, as from July 14, of Mr. J. H. Nidd, chemist and druggist, 714 Rochdale Road, Manchester. The company has also recently purchased the businesses of Mr. J. Hodgson, chemist and druggist, Clayton-le-Moors, Mr. W. Mitchell, chemist and druggist, Bolton Street, Bury, and opened a branch at "Mayfield," Walmersley Road, Bury.

Personalities

MR. W. SUMNER, Ph.C., has been appointed assistant lecturer in pharmacy at Cardiff Technical College.

MISS MARY CLARK, daughter of Mr. Cicero S. Clark, chemist and druggist, 12 Richmond Road, Bayswater, London, W., has obtained the B.A. degree of London University.

MR. H. M. ASHTON, chemist and druggist, Beaumaris, was knocked off his bicycle by a motor-car on July 11, and sustained severe injuries to his right hand, wrist and ribs. Mr. Ashton is progressing favourably.

MR. ENU BONTCHEFF, rose oil distiller, Kazanlik, Bulgaria, who has been on a visit to London this week, stated in an interview that as the rose crop at the beginning of the season was attacked by the Agrillus grub it would take some three years before the rose trees are clear of this pest. He is of the opinion that the Bulgarian Government should elaborate a plan, for, say, ten years, to replant the existing rose acreage in other unexhausted soil. According to Mr. Bontcheff, the soil is exhausted and not well manured, and no doubt this is the reason that the plants are not strong enough to resist the pest.

MR. J. W. WARE, Durban, who is a member of the bowling team to represent South Africa in British Empire Games at Hamilton, Ontario, Canada, expects to be back in London about the end of August, and will be glad to hear from any of his friends in this country. Letters should be addressed c/o Standard Bank of South Africa, Ltd., 10 Clement's Lane, London, E.C.4.

Information Department

INFORMATION WANTED

Postal or telephone information with respect to makers or first-hand suppliers of the undermentioned articles will be appreciated.

B/187. Albright teats	W/187. Prawn brand colloidal sulphur
E/217. Bell's Clarobright	B/177. Protosee injection
B/187. Besredka's vaccines	E/217. Sanerin pessaries
E/217. Ceredine pills	E/217. Spring's Orange Squash
W/227. Fistania	L/147. Vitol sulphur candles
B/177. Nostroleum	
B/177. Novotoxin	

Observations and Reflections

By Xrayser III

Proprietary Remedies

ordered in prescriptions for insured persons are not, perhaps, the cause of such greatly increased cost of National Health Insurance medicines as some chemists imagine; but French pharmacists, who suffer so much from the prescribing of proprietaries, are acting wisely in giving special consideration to this practice before committing themselves in the matter of arrangements for national insurance service. Your correspondent who directs attention to this movement in France (*C. & D.*, July 19, p. 91) asks if patients cannot be treated equally as effectually without proprietaries as with them. Generally speaking, they can, though allowance must be made for the use of proprietary remedies for which there are no suitable non-proprietary equivalents. Ill-taught prescribing is the cause of most of our trouble in this respect, since so many doctors start their professional life without knowing how to write proper prescriptions, and, in consequence, they fall an easy prey to the wiles of the manufacturers of proprietary preparations. I have always considered it a mistake to allow the prescribing by panel practitioners of proprietary brands of medicinal preparations for which there are well-known equivalents which may be made by anyone. Such prescribing not only adds something to the cost of drugs used in the National Health Insurance service, but it compels us to keep in stock more than one variety of the same preparation, sometimes several in fact. This I consider unreasonable, and I am surprised that the Drug Advisory Committee has not yet seen fit to give us a strong lead in the direction of providing a remedy for our grievance in the matter. It is difficult to avoid thinking that representatives with a more practical working knowledge of what the prescribing of proprietary brands of quite ordinary medicinal preparations means to us would be more helpful as stimulators of much-needed reform.

The Draft Bill

cannot, of course, be discussed adequately at the delegates' meetings to be held at Cardiff, but the occasion is evidently thought to be a useful one for window-dressing purposes. At the first session, on the Tuesday afternoon, all the time available is pretty certain to be taken up with more or less official statements, whilst the limited time available on the Wednesday morning for the second session is apparently to be encroached upon by a further statement from President Melhuish. This particular statement is to be the actual basis of discussion, so that the delegates who speak will be compelled, willy-nilly, to keep within bounds. This is not to say that the result may not be pleasing to most of those who attend, but I feel dubious about it leading us anywhere in particular. The whole business savours of disinclination on the part of the Pharmaceutical Council to take a strong lead. Whatever may be the views of certain branches of the Society, or of prominent members of those branches, it seems clear to me that decisions must be made by the Council, and it seems the acme of feebleness to look for guidance at the Cardiff meetings in order that decisions yet to be arrived at may be put up for acceptance by another lot of delegates during the approaching autumn.

The Three Chief

alkalis—soda, potash, and ammonia—may be likened to the three legs of the great tripod which carries the whole paraphernalia of the laboratory of practical chemistry. The names of the two latter have been elucidated with a considerable measure of success; but "soda" is still surrounded with much obscurity. As the word does not yield a glimpse of self-revelation it invites some attention from anyone who has a *penchant* for trivial matters of this kind. The only

light the O.E.D. offers is to the effect that it has come to us through medieval Latin and that it is of unknown origin. Whether the word here referred to is connected with the substance we have in mind is rather doubtful. During the middle ages "soda" was employed as a medical term for a variety of headache, as may be seen from the works of Rhazes, Avicenna, Albucasis and their successors. Accordingly this Arabic word became acclimatised to its Latin environment in Europe with its exact original meaning. A quotation from "The General Practice of Physic," by Christopher Wirtzung (1617), which was one of the earliest books of the kind to appear in an English dress, will serve to show that the Arabic term was thus appropriated by the European doctors—he says, "There are many pains in the head, by the Arabians commonly called *Soda*." With this meaning "soda" continued to find a place in the medical vocabularies until the middle of the eighteenth century. The various authorities writing after the time of Stephen Blancard (1693) followed in his footsteps. His definitions were: "*Soda*, the same as *Cephalalgia*; *Soda*, the same as *Ardor Ventriculi* [Heartburn]; *Soda*, the Ashes of the Herb *Kali* burn'd, whereof Glass is made."

It May Be

that the word we should seek in the Latin writings of the middle ages is "*Sodanum*," for this is the word given by Du Cange—with the definition, "*Herba vitrearia sylvestris*." From this came the "soda" to which Blancard attached his third definition. There is some confusion here, if we compare the two meanings—the first applied to the so-called "glass-wort" and the second to its ashes. We may profitably point out that Blancard's book was not the first in English to associate "soda" with *kali* or al-kali. In 1678 there was published a translation of Geber's "*Summa Perfectionis in magisterii*" by Richard Russell (a reprint appeared two years ago). In the fourth book of this work there is a chapter "of the Preparation of Middle Minerals" where there is the statement that "*True Salt-Alkali* is made of *Zoza* dissolved, filtered, and the *Solution* boyled away to one third part, and then the *Salt*, in a short time, settles to the *Bottom* in *Crystals*." A reference to Beckmann's classic article on saltpetre ("*History of Inventions*") gives us the Latin original of the above passage, and from it we learn that "*Zoza*" or "*Soda*" was the name of the plant yielding the alkali. This name then was transferred to the crystals. It would not be safe to assume at present that Geber was really responsible for this statement, because it may be a gloss by a scribe of a later period. When did the name become definitely connected with the substance—that is—the crystallised alkali? In the eighteenth century the pro-chemists, if we may so call them, denominated the alkaline ashes, often called *barilla*, fixed mineral alkali, and continued to do so until the advent of the great French work by De Morveau and Lavoisier—on the new nomenclature—which arrived in 1787. But from what has been said it seems most probable that as early as the sixteenth century "soda" was so used, as was also the name "natron." At the beginning of the eighteenth century the whole matter is summed up so satisfactorily by Boerhaave that the Arabic origin of name and substance came hardly to be in doubt. He says (English edition, "*New Method of Chemistry*," 1727): "*Kali* is the name of a plant growing in Egypt, about the mouth of the river Nile . . . When burnt in the fire leaves a copious, fixed salt behind in the ashes. And this is the salt which comes to us from Scanderoon under the name of *Soda*, and is a principal ingredient in glass." It would be interesting to learn the views of an Arabic scholar in respect of the two Arabic words signifying headache and the ash of the glass-wort or salt-wort.



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Editorial Articles

The Conference Papers

THE Cardiff meeting of the British Pharmaceutical Conference during the present week has evidenced the keenness of South Wales pharmacists in furthering the objects for which the Conference stands and in filling the not exactly easy position of hosts. The larger attendances at recent Conference gatherings—larger, that is to say, than in pre-war years—have not, as it happens, resulted in a corresponding increase in the number of science papers presented. The Cardiff Conference of 1891 received, as we point out on another page of this issue, twenty monographs; at Chester, in 1914 (the last pre-war meeting), the number was eighteen; and soon after the resumption of normal working following the war it reached its present average of about twenty-two. The chairman's address on these occasions forms in one aspect an introduction to the science papers, but in essentials stands in a class by itself. This year the Conference was fortunate in securing the services of Mr. John Humphrey in the chair. For Mr. Humphrey's experience in the varying spheres of pharmacy it is difficult to think of a parallel. Lecturer and secretary of the Sheffield School of Pharmacy; sub-editor and then (for a long period) editor of "The Pharmaceutical Journal"; joint author of "Pharmacopodia"; chiefly responsible for the "British Pharmaceutical Codex," "Pharmaceutical Journal Formulary," and "Pharmaceutical Pocket Book"; an organiser of schemes for pharmaceutical federation and National Health Insurance administration; a president of three local associations; a chairman of the London Pharmaceutical Committee and an officer of the Middlesex Pharmaceutical Committee; an examiner to the Pharmaceutical Society, and afterwards a member of its Council and chairman of its Publications Committee—here, in outline, is a record of sustained work that is quite exceptional. We do not propose to pay Mr. Humphrey the

dubious compliment of attempting to condense the subject-matter of his address into a sentence or two: it must suffice to indicate that under the title "The Province of Pharmacy" he has given us a thoughtful discussion of the present qualification of the pharmacist, ending with suggestions, such as the possibility of including biology and physiology in the Intermediate examination, that may well form a starting point for staking out the claims of the coming generation. Turning to the Science Section, we may briefly summarise the contents of the papers in their order of occurrence in the official list. The first paper, by Mr. Charles M. Caines, gives details for the preparation of a satisfactory *Injection of Iron and Arsenic*, and suggests a formula. Owing to the natural variations in the optical rotation of camphor, the determination of this substance in spirit of camphor by optical methods cannot be accurate unless the optical rotation of the camphor used is known. The work described in the paper by Mr. F. H. Milner—*The Variation of Specific Gravity and Refractive Index with Concentration of Camphor and Alcohol in Spiritus Camphoræ, B.P.*—was undertaken with a view of determining the possible variations in this product if properly made and stored. Mr. C. M. Caines has investigated seven processes, official and non-official, for the assay of stramonium leaves and tincture, with the result that he obtained the most satisfactory result with a new modification of the British Pharmacopœia process. Messrs. C. T. Bennett and F. C. L. Bateman, in a note on the *Diastatic Power of Malt and Malt Extract*, suggest that the Lintner test, even with the most recent modifications, is unsatisfactory, and that sufficient evidence has been put forward to show that the method of determination adopted by the Ministry of Agriculture needs amendment. Under the collective heading, "Studies in Emulsions," three papers have been written; these are concerned with *Examination and Analysis* (Messrs. E. L. Smith and G. N. Grinling), *Some Observations on Manufacture* (Mr. E. L. Smith and Miss V. Hazley), and *A Factor Inhibiting the Emulsification of Cod-Liver Oil* (Mr. E. L. Smith). Part I deals primarily with emulsions intended for oral use, but many of the tests given would be equally applicable to liniments and similar preparations in which the emulsifying agent is usually soap. Experience obtained during the manufacture of pharmaceutical emulsions is embodied in Part II, and many useful observations are made. Part III suggests a method to determine the suitability of a cod-liver oil for the preparation of emulsions. Mr. Samuel Goldberg contributes a paper in which he gives the results of an investigation into the Dutch process for making *Crude Fibre*. The author is of opinion that the process, with certain modifications, is well suited for microscopical work. Mr. N. I. Hendey submits a careful study, from chemical, physical and microscopical points of view, of *Diatomite: its Analysis and Use in Pharmacy*, previous work on which, he points out, is scattered and difficult of access. Messrs. P. A. W. Self and C. E. Corfield contribute a description of *A Simple Form of Continuous Extraction Apparatus* which may be used for any solvent boiling at a reasonable temperature. The apparatus has the advantages of cheapness, ease of construction and efficiency. The same two authors have worked out an improved process for *The Determination of Total Alkaloids in Cinchona Bark*, showing incidentally the weak points

in existing methods. Messrs. F. J. Dyer and F. Wokes discuss, by way of comment on results obtained with twenty-four samples, the *Variation in Colour-Test Value of Commercial Samples of Cod-Liver Oil*, and make suggestions as to the scope of the test. Messrs. W. J. Beardsley and F. J. Bolton have made numerous trial batches of *Tincture of Capsicum, B.P.*, with the object of obviating the deposit that usually occurs in cold weather. They suggest a new formula. Miss E. M. Smelt contributes a *Note on Extract of Colocynth*, showing that the United States Pharmacopœia process for this galenical needs amendment. Mr. C. Morton presents an elaborate study of *Some Oxy-Acids of Phosphorus*, the neutralisation curves of which he has determined by means of the hydrogen electrode, together with other factors. Messrs. A. D. MacDonald and W. Schlapp have evolved a technique of decerebration for a modified cat method of *Digitalis Assay*, by which means, they claim, the experimental error can be reduced to an average deviation not exceeding 4 per cent. Mr. G. W. Marris contributes some *Notes on the Chemical Assay of Mercurochrome "220,"* the paper being based on a series of tests arising out of the everyday control of manufacture, with the object of showing the degree of accuracy with fairly rapid methods. Mr. A. H. Ware has devised a *Systematic Qualitative Analysis of Vegetable Extractives*, somewhat on the group system familiar in chemistry, using as reagents ferric chloride, nitrous acid, ammonia, formaldehyde and Mitchell's reagent. Further details are promised at a future date. Mr. G. J. W. Ferrey communicates a paper on *The Rapid Iodimetric Determination of Iron in Scale and Other Pharmaceutical Salts*, in which the iodimetric determination of the U.S.P. is criticised and conditions are worked out in which ferric iron in pharmaceutical salts may be determined rapidly. Mr. S. G. Liversedge contributes a further study of the *Gravimetric Electro-Deposition of Metals and its Application to Pharmaceutical Chemicals*. The author has been able to carry out numerous analyses by means of Sand's electrolytic apparatus. Another paper on *Iron and Ammonium Citrate, B.P.*, by Messrs. A. J. Jones and N. Glass, prompted by recent Conference papers on the subject of specimens of iron and ammonium citrate giving undesirable precipitates in solution, and with magnesium sulphate, records results of analyses of trade samples and recommends an assay by iodimetry. This paper deals with the subject from a practical manufacturing point of view. In a paper on *Achromatic Indicators* Mr. E. Lester Smith gives a *résumé* of previous work on indicators, and describes combinations of indicators, or of indicators and dyes, which improve their usefulness for specific purposes. The accuracy obtainable is increased by using brilliant colours with small PH interval and blending the indicators, or by the use of a dye complementary in colour to that of the indicator near the mid-point of its range. The scope of these twenty-two papers extends from pure science to practical hints easily carried out; in this respect they are typical of Conference tradition. In their general contents they will be found of good average quality. As we go to press we learn with satisfaction that on its social side the Conference is entirely successful, thus maintaining its position as a red-letter event in the calendar of pharmacy.

BRITISH PHARMACEUTICAL CONFERENCE

THE PROCEEDINGS

CARDIFF has on one previous occasion been the meeting place of the British Pharmaceutical Conference—in 1891, when the Conference was less than thirty years old, and the attendance at the opening session numbered only eighty-five. Other differences between the city as it was thirty-nine years ago and as it is to-day strike the eye on looking through the *C. & D.* account of the proceedings, with its illustrations. The front of the old Town Hall elicited from our representative the qualified praise that it was "rather" handsome; the University College building (formerly an infirmary), lent for the sessions, has the appearance of three villas joined together; and the St. Mary Street of the 'nineties shows a primitive kind of horse omnibus apparently about to run over some people who are crossing in front of it, while a vehicle distantly resembling a wagon is proceeding on the wrong side of the road. The late Professor Redwood, in seconding a vote of thanks for the presidential address at the opening session, was able to speak of Cardiff as it was seventy years earlier still, when he commenced his apprenticeship in the city; at that time, he told his audience, the population numbered 4,000 or 5,000, and there were neither docks nor railways.

The president of the Conference in 1891 was Mr. William Martindale; the fifteen vice-presidents comprised eleven past-presidents and Mr. Michael Carteighe, Mr. A. Kinninmont, Mr. J. Munday and Dr. J. C. Thresh; the treasurer was Mr. R. H. Davies; the general secretaries were Mr. W. A. H. Naylor and Mr. F. Ransom (both, happily, still with us); and the local secretary was Mr. Alfred Coleman. The authors of the science papers included Mr. A. H. Allen, Mr. S. M. Burroughs, Mr. R. A. Cripps, Mr. A. W. Gerrard, Mr. E. M. Holmes, Mr. F. Ransom, Dr. S. Rideal and Mr. W. H. Symons; the number of monographs presented was twenty, about the average for recent years. Among the visitors in our list were Messrs. A. H. Allen, S. R. Atkins, F. C. J. Bird, R. Bremridge, D. B. Dott, A. W. Gerrard, J. P. Kay, Peter MacEwan, W. H. Martindale, W. A. H. Naylor, F. Passmore, J. C. C. Payne, H. W. K. Pears, J. Phillips, F. Ransom, W. D. Savage, G. F. Schacht, A. Southall, T. Tyrer, J. C. Umney, H. S. Wellcome, and T. Howell Williams.

The social events of the Conference derived unusual *éclat* from the presence of the Marquis and Marchioness of Bute (parents of the present Marquis) at the opening reception. As Mayor of Cardiff, the Marquis also welcomed the Conference on the following morning.

Excursions to Barry Dock and Caerphilly Castle shared the programme with more serious items on Tuesday and Wednesday. Some of the party returned from Caerphilly in brakes, a term that to the younger generation of to-day almost needs a dictionary. Thursday's excursion, partly by train and partly by horse vehicles, took the company through the Forest of Dean and included typical views of the Wye. A smoking concert on Wednesday evening appears to have been an outstanding success, with the aid of such amateurs as Mr. A. H. Allen, Mr. Thomas Tyrer and Mr. J. C. Umney. Mr. Allen's lecture on "Cats," in particular, reduced his audience to a state of helpless laughter. We read that the chairman "ventured into the very imposing throne-chair which the landlord had provided for him," indicating that things were done in style. The smoking concert of Wednesday evening was followed on Thursday evening by a "fruit concert." With this exception, and that of the new Sports Day, the Cardiff Conference of 1891 must have resembled its successor of 1930 fairly closely.



ALDERMAN WILLIAM CHARLES, J.P.
Lord Mayor of Cardiff

Monday Evening's Reception

Cardiff City Hall lends itself admirably to a function like the Conference reception: the interior is in keeping with the exterior (already familiar in illustration to *C. & D.* readers), and no higher praise can be given. The guests on Monday evening were received by the Lord Mayor of Cardiff and the Lady Mayoress, the president of the Conference and Mrs. Melhuish, the chairman and Mrs. Humphrey, the chairman of the Local Executive (Mr. J. D. Jenkins) and Mrs. Jenkins. Several of the notabilities of pharmacy were present—for instance, Dr. G. Claridge Druce, Mr. D. Lloyd Howard, Mr. T. Edward Lescher, Dr. D. B. Dott, Mr. W. B. Trick, Mr. E. S. Waring and Mr. J. H. Franklin; and during the evening a grandchild of Mr. Jabez Jones, the veteran Cardiff pharmacist, presented the Lady

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Mayoress with a bouquet. A similar compliment was paid to Mrs. Melhuish (Miss Joan Jenkins, daughter of Mr. J. D. Jenkins, made the presentation) and to Mrs. Humphrey. To the strains of an excellent band, dancing commenced at an early stage in the proceedings; before, indeed, the long procession of visitors had wound its way up the staircase. The Conference was thus ushered in with every augury of success.

Opening Session

Tuesday, July 22

The tonic breezes of Cardiff, whether on this occasion arising in the neighbouring hills or in the Bristol Channel, were doing their beneficent work on Tuesday morning as little groups made their way to the Technical College across the open spaces that the new public buildings so brilliantly adorn. One of the halls of the College was filled to overflowing as the mayoral procession entered and proceeded to the platform, disclosing the fact that the attendance was of quite average, or more than average, proportions. Supporting the chairman of the Conference were the Lord Mayor of Cardiff (Alderman William Charles), the Lady Mayoress, the president of the Pharmaceutical Society (Mr. A. R. Melhuish), the ex-president (Mr. L. Moreton Parry), Mr. Philip F. Rowsell and Mr. Herbert Skinner (past-presidents), Dr. G. Claridge Druce (past-president of the Conference), Mr. R. R. Bennett and Mr. D. Lloyd Howard (past-chairmen of the Conference), Messrs. W. J. Beardsley, J. Keall and T. Marns (members of the Society's Council), Mr. H. N. Linstead (secretary of the Society), Principal Coles (Cardiff Technical College), Dr. F. W. Crossley Holland (treasurer of the Conference), Messrs. C. E. Corfield and G. R. Boyes (secretaries.)

The opening speeches were couched in cordial terms that evoked a ready response from the audience. The Lord Mayor blended the gay and the serious in his remarks with the skill of a practised master of assemblies, and the president was not less felicitous in his reply to the official welcome. The chairman's address has the double merit of sounding well and reading well; our readers in all parts of the world will, no doubt, turn with zest to the full text printed on pp. 102-106 of this issue. With the veteran Dr. Claridge Druce on the platform, the chairman's suggestion that too much importance is attached to botany in the curriculum naturally evoked general laughter. Dr. Druce made his riposte a little later, in seconding a vote of thanks to the chairman, in his own inimitable fashion, making the speech of the day, and, incidentally telling one or two of his irresistibly funny stories.

With the chairman's reply the opening session ended and the reading of science papers commenced, about eighty members remaining after the ladies and their escort had departed.

Opening the proceedings, the CHAIRMAN (Mr. J. T. Humphrey) called upon the Lord Mayor to welcome the Conference to Cardiff.

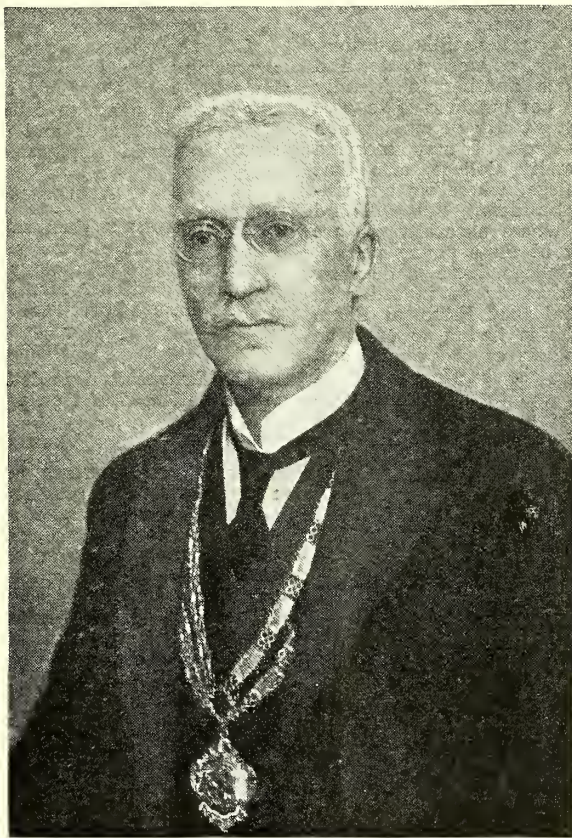
LORD MAYOR'S SPEECH

The LORD MAYOR: Mr. Chairman, ladies and gentlemen, this is the last conference during my year of office, and it has been my privilege during the last few months to welcome a great number of people from almost every part of the Kingdom to this city of ours. I would like to say that although you are the last,

you are by no means the least, not only in size but importance as well. I welcome you heartily to this city of ours, and I hope that you will have a pleasant time during your stay here. I understand that you are one of the oldest bodies in the kingdom, and that you had your Charter as far back as 1841, and during that time you have been very busy indeed. The activities of your Society have reached almost every department of life, and the main part of your work is to see that chemists and druggists are people who have passed certain tests, and that the shops and establishments are kept up to the right standard you should expect them to be. (Hear, hear.) You have also given great attention to educational work. This is one of your great platforms. You are trying to get your young people up to a certain standard. They are required and expected to pass a certain standard before being allowed to take any part in your work.

You have also given great attention to research work, and the work of the scientist has been one of your main objects. I can hear you tapping here and there on some

kind of geology and botany, and continually squeezing, hammering and trying to find out different things, listening to what every little brook will tell you, and how the water in that brook may help you in your work. I can almost imagine you also working on every little herb on the roadside for what it will teach you, and how it will help you to minister to the needs of mankind. I can again almost hear you day by day asking the questions and receiving answers. This is the main part of your work, to find out how Nature can help mankind. I can also hear you tapping the air, and asking the air, the sun, and the moon, "How can you help me to be a help to those who are blind and deaf?" This is part of your work. To you we always come when we have the least pain or trouble—real or imaginary. (Laughter.) We not only come to you for help, but always come to you for certain kindness and comfort. We know how you



MR. A. R. MELHUISE
President of the Pharmaceutical Society

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soothe us, and, going away helped, we thank you for this.

I am very glad, however, to find that you do not devote your whole time in research work, in finding out, in healing, but that you also come together in friendly intercourse, as you are to-day, when we all want to meet and know each other. And, after all, this is the highest part of mankind, to know and understand one another, and to contribute something from one to another, in order to help one to a higher standard. I am glad to meet you in this way, and I am sincerely glad to meet you in this great city. We are proud of our city—(hear, hear)—and we hope that after you have been here during this week you will all be proud of having been here, and we hope that you will not go away with regret, but with kindly remembrance of us and our city. I hope that when you go away from here your memory of our city will be as sweet as the roses.

I have no intention to keep you long this morning. I know that you have a great deal of work to do, and also to find out, and meet one another in friendly intercourse. My only object in coming here is to give you a hearty welcome to this great city of ours, which contains so many beautiful things. I may mention specially one place—the University College, also that useful place, the Technical College, where we are trying to combine education with business. You will find interesting young people here, where naturally we are equipping them for life. Many of these young people, who have passed through the College, have made their mark in the world. The University is indeed well worth a visit, and you will find that Principal Reece is a most remarkable man, who is trying to combine scientific training with the business of the world, and for equipping young people for the battle of life. I wish to mention another place, and that is our beautiful Welsh National Museum. It is brimful of interest in Welsh life of the past, and Welsh life as it is to-day. I hope that you will find time to go to the National Museum. It is a wonderful building, and we are proud of it, and proud that it is in Cardiff.

His Lordship went on to describe lucidly the many attractions and points of interest within the city, including its spacious and lovely parks. They had only to cross the Channel to reach the beautiful counties of Devon, Cornwall and Somerset, and they could see the hills of Breconshire, where the beautiful water came from, and some of the men and women, including himself. (Laughter and applause.) There was, he added, a wide field within a short distance, and they could visit the old city of Llandaff, with its beautiful cathedral. In conclusion, his Lordship expressed the earnest hope that they would have a very happy time during their stay. (Applause.)

THE PRESIDENT'S REPLY

The PRESIDENT (Mr. A. R. Melhuish) said: Mr. Chairman, Ladies and Gentlemen, I have a pleasant and happy duty to perform this morning, and that is to endeavour to express on your behalf and for myself, something of what we feel of gratitude to the Lord Mayor for coming here this morning, and giving us such a very eloquent and kindly welcome. We came to Cardiff, some of us, with misapprehension, expecting to find a town of coal dust and smut, but on arrival we find a beautiful city. Sir, you have said that you hoped that we should go away with kindly memories of the city. There can be no possible doubt about that, I think. We are here to-day to receive this official welcome from the Lord Mayor, and I can say this, that we do indeed appreciate this kindly welcome, which has been given to us, and we much appreciate the splendid facilities which have been extended to us for our meetings. We do sincerely appreciate the welcome and the generous reception you extended to us last night. (Applause.) Last night you welcomed us, and started this Conference. We feel very deeply the good start which you have given to this Conference, and if last night can be taken as anything of the forecast

for the success of the Conference, it is going to be one of the most successful we have ever held. We hope that during the course of this week to do something in the nature of an inspection of your beautiful city. You have given us something of a description of it, but from what I have seen from previous visits, I think you, my Lord Mayor, have not quite done justice to your own city; but it remains for us to go and inspect this beautiful city and its ancient monuments, and see for ourselves something of the interesting part of Cardiff and its beauties. After referring to other places of interest, the president said that by the courtesy of the Marquis of Bute they were invited to visit the beautiful castle of Caerphilly, and they hoped to see something of the beauties of the Wye Valley.

I thank you, concluded the president, for the kindly and sympathetic welcome you have given us to-day. I am certain that we are going to enjoy every moment in this city of Cardiff. (Applause.)

The CHAIRMAN added that he wished to endorse everything the president had said. They must not, he said, keep the Lord Mayor any longer, as he had other engagements to fulfil.

The Lord Mayor and Lady Mayoress then left the assembly amid applause, all the members standing.

APOLOGIES FOR ABSENCE

The CHAIRMAN then said that in spite of the large attendance there were a few friends absent; he had received letters of apology from Dr. David Hooper, Mr. Wright (Buxton), Mr. Ransom (Hitchin) and Mr. W. A. H. Naylor.

CHAIRMAN'S ADDRESS

The CHAIRMAN next delivered his address, the text of which will be found on pp. 102-106 of this issue.

VOTE OF THANKS

Mr. R. R. BENNETT said: It is a great pleasure to recognise in the present chairman this morning one who has been a leader of pharmaceutical thought for a generation or more, and doubtless to all of us, when twelve months ago, on Mr. Humphrey being elected to the highest office this Conference can offer, this seemed but to be in strict accordance with the eternal fitness of things. It is, therefore, with great pleasure that we see him here this morning surrounded and honoured by his pharmaceutical colleagues. It is obvious from the reception that you have accorded to the chairman's address that we should expect an intellectual feast, and we have suffered no sense of disappointment. I hope that in the course of this morning's proceedings our appreciation will be entered in appropriate terms. It is a great privilege for me to speak from this platform on behalf of everyone here, and I venture to feel that I am speaking also for the many members of this Conference who are not with us this morning but who will have the pleasure of reading this address in print later to which we have just listened. By seemingly well-established tradition no discussion is allowed on the chairman's address. (Applause and laughter.) Later on we shall read and re-read it, and debate among ourselves the many interesting points the chairman has presented to us. I know that I shall not be accused of exaggeration or flattery when I say that the chairman will be long remembered for his address this morning, and not only for that, but also for his kindly and gentle leadership throughout the week. It is a great pleasure to me to propose that we give him a very hearty vote of thanks for his most interesting and important address. (Applause.)

Dr. G. CLARIDGE DRUCE said: I wish to second the vote of thanks to the chairman for the very interesting address he has given us. It is the outcome of years of experience and contains in it matters closely connected and interests which we may discuss. It did bring back to my mind an incident which happened over sixty years ago. When in business in Northampton, we had a varied and large business dealing in everything from a

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blacklead upwards (laughter), I went to spend a week-end with a country doctor, one of our customers. I looked forward to the visit with some degree of interest. The first morning after breakfast the door bell rang, and the doctor was called out to extract a tooth from the mouth of an agricultural labourer. He was put on a low wall round the courtyard, and the doctor brought out a pair of forceps of a considerable age, hoary with antiquity, and with them he attacked the man. The doctor was shorter than I am, but much further round. (Laughter.) He attacked that tooth with a degree of agility, which I should not have suspected him capable of. He dragged that poor wretch round the courtyard two or three times at least. The doctor then sat down on the ground because the tooth had broken, and there was a lacerated gum, but I will not picture too closely. The doctor had to attend a poor old cripple man for pleurisy, and the doctor ordered him to have six leeches applied, and prescribed half a dozen pills to be taken at night. He naturally dispensed his own medicine, and transposed the labels. He then called upon the patient two or three days later, and the man was much better, but the patient added that he would like to have them boiled next time. (Laughter.) That, I think, incidentally rather points to one of the chairman's remarks, when he said that it was quite time that the application of medicine should be left to pharmacy and not left in the doctor's hands. A year ago I ventured to say that after all in our own business as in scholastic work in England, the one great nuisance to-day is the overcrowding of subjects. We cram into our school hours numbers of subjects, which after all are far better left alone, to be acquired by a boy later when he has left school. I have recently had a letter from a boy, who had been for six years at a grammar school—I will not say in which city—and he addressed me as "Dr. Alderman Druce, Esq." (Laughter.) That sort of thing does point to the fact that we must not overcrowd our examination subjects. After passing his examinations the boy of to-day should remember that he has later to pass the more intense examinations of his fellow citizens, namely, the examinations of his customers. The boy who has passed in the most brilliant examination may not succeed unless he has the common sense to adapt himself to the needs of the time and his customers. After all, what is needed is a wide knowledge of all-round subjects, such as those in past time possessed. Some of you will doubtless remember Mr. Robert Drane, who was one of the true type of successful chemists. He knew his own business, but he also knew about the things around him; the history, the antiquity, and even the plants of the district in which he lived and worked. One could always go to him with the full assurance that he would give cheap, good and sympathetic advice. Concluding, Dr. Druce said that he wished most heartily to second the vote of thanks, and to add that they all rejoiced to see the chairman restored to health. (Applause.)

The CHAIRMAN said that it was good of them to give him such enthusiastic thanks for his modest efforts, which represented his thought during the past fifty-three years in which he had been connected with pharmacy. He hoped that it would give cause for thought, when read by the rest of the 22,000 in the Register. The chemist and druggist—the retail business man behind the counter—had always been close to his heart during the whole of his career, and the object when he set himself to prepare the address, was to see if it was possible to develop the youth's training and qualification in such a way that, instead of leading up to a blind alley where no occupation would result, there would be some definite financial return to be obtained from extra knowledge acquired. There had been distinguished friends of pharmacy who had suggested that the chemist should be interested in clinical work, but he thought that subject should be left to the young doctors training in hospitals. The chemist's shop was an institution in Great Britain.

Science Section

Tuesday Morning

The first paper taken, presented by Mr. Norman Evers, was:—

Injection of Iron and Arsenic

By CHARLES M. CAINES

[ABSTRACT]

GREEN iron and ammonium citrate is a complex ammonium ferryl citrate, readily and completely soluble in water. It should contain from 15 to 16 per cent. of iron, and ammonium citrate equivalent to 8.1 per cent. of ammonia. A satisfactory injection can be prepared by dissolving 2.5 gm. of the salt in a sufficiency of distilled water, adding the required amount of arsenious acid dissolved in a slight excess of ammonia, and almost, but not completely neutralising with ammonia solution and making up to 100 c.c. The commercial salt, however, varies in composition, and particularly in acidity.

The results of an examination of samples obtained from representative manufacturers are recorded below:—

	Acidity in No. of c.c. N/2 NaOH required to neutralise 1 gm. to phenolphthalein	Percent. Fe.	Percent. NH ₃
a	4.7	15.2	6.88
b	4.9	15.0	7.39
c	3.9	15.4	7.31
d	2.7	14.5	8.16
e	3.4	15.3	7.35

It will be seen from this table that the figures for the acidity of the salts varied from 2.7 to 4.9 c.c. N/2 sodium hydroxide solution per gm. of salt; the per cent. of iron from 14.5 to 15.4; and the per cent. of ammonia from 6.88 to 8.16, only one sample falling within the requirement of 8.1 per cent. of ammonia, this sample being the nearest to the above requirements. For purposes of comparison the figures for the acidity of the samples are reproduced below side by side with the figures for the acidity of injections prepared according to another formula in general use, viz.:—

Green iron and ammonium citrate	6.5	gm.
Sodium arsenate	0.274	gm.
Phenol	0.5	gm.
Strychnine hydrochloride	0.11	gm.
Distilled water sufficient to produce	100	c.c.

Ferri et ammon. cit. green	a	b	c	d	e
No. of c.c. N/2 NaOH required to neutralise 1 gm. to phenolphthalein	4.7	4.9	3.9	2.7	3.4
Inj. iron and arsen.	f	g	h	i	k
No. of c.c. N/10 sodium hydroxide solution required to neutralise 5 c.c. of injection to phenolphthalein	8.5	8.5	7.0	5.0	6.5

A sample of a well-known and widely-used injection in which the arsenic is present in the arsenious condition showed an acidity of only 0.6 c.c. N/10 sodium hydroxide solution per 5 c.c. of injection. The table shows the figures for the acidity of the injection to vary according to the acidity of the iron salt used. The presence or absence of acidity is one of the chief factors in determining the production or non-production of intense pain at the site of injection, and it is essential to reduce the acidity of the injection to the minimum. The isotonicity of the solution is also a point of considerable importance, and in this respect, the use of 4 per cent. and 6.5 per cent. solutions of the green iron and ammonium citrate are not to be recommended. It was decided to try whether it was possible to avoid the use of the iron scale preparation and to prepare the

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injection direct from the official liquor ferri perchloridi fort. The interaction while hot, of two molecules of ferric hydroxide and three molecules of citric acid yields tricitrato-diferric acid and that treatment of this with three molecules of ammonia gives the triammonium ferric citrate $(\text{Fe}_2(\text{C}_6\text{H}_5\text{O}_7)_3)(\text{NH}_4)_3\text{H}_3$. This reaction was taken as the foundation of the process.

The result of experimental work showed that for the preparation of a satisfactory injection it was necessary to observe closely the following details:—
1. Precipitation of the ferric hydroxide must be effected in the cold. 2. The diluted ferric chloride solution must be added to the diluted ammonia solution with constant stirring and not vice versa. 3. The precipitated ferric hydroxide must be washed free from chloride. 4. The citric acid solution must be concentrated and hot, but not boiling. 5. It is convenient to add a portion of the ferric hydroxide suspension first and, when dissolved, to add the remainder and heat until the change of colour occurs. 6. The addition of solution of ammonia produces a brilliant green solution, passing to a yellow shade of green, the more nearly the point of neutralisation is approached. 7. It is advisable to adjust the final proportion of solution of ammonia until the injection gives no red colour with either methyl red solution or with phenol red solution.

The formula suggested is as follows:—

Liq. ferri perchloridi fort. B.P.	... 1.75 c.c.
Citric acid	... 2 gm.
Arsenious anhydride	... 0.13 gm.
Solution of ammonia	... q.s.
Distilled water, sufficient to produce	100 c.c.

Six c.c. of solution of ammonia is diluted with 25 c.c. of distilled water, and the strong solution of ferric chloride diluted with 40 c.c. of distilled water is added very gradually and with constant stirring. The mixture is allowed to stand for two hours, with intervals of stirring every quarter of an hour. It is filtered through a Büchner filter under slight suction, and washed with distilled water until absolutely free from chloride. It is suspended in 10 c.c. of distilled water, a further 10 c.c. of distilled water being used to wash the spatula, and the suspension of ferric hydroxide added to a hot solution of the citric acid dissolved in 5 c.c. of distilled water, adding a small portion of the suspension first and allowing it to dissolve before adding the bulk of the suspension. It is maintained at a temperature just below b.p., until the liquid changes from its original brownish red colour to a yellowish green. It is then diluted with 20 c.c. of distilled water, the solution of the arsenious anhydride in 15 c.c. of distilled water and 1 c.c. of solution of ammonia added, a further 1.5 c.c. of solution of ammonia added or sufficient to give a reaction neither acid to methyl red nor alkaline to phenol red (Ph 5 to 7), and sufficient distilled water to produce 100 c.c.

The 1.75 c.c. of strong solution of ferric chloride contains an amount of iron equivalent to 2.5 gm. of green iron and ammonium citrate and 1 c.c. of the injection contains approximately $\frac{1}{15}$ grain of iron, and $\frac{1}{50}$ grain of arsenious anhydride.

DISCUSSION

Mr. BERRY inquired how the isotonicity of this injection compared with that of the British Pharmaceutical Codex.

A MEMBER asked whether the action of light on the injection had been investigated.

Mr. FOURACRE explained that a corresponding injection had been made at the Westminster Hospital for two or three years past with green citrate of iron and ammonium and liquor arsenicalis. The formula was quite simple, and the results were clinically good.

Mr. BARRY remarked that he had not succeeded in getting the change of colour with such a formula.

Mr. EVERS, replying to the discussion, said that the object of the paper was to provide a formula without using green iron and ammonium citrate. He had no

details available as to the isotonicity. The action of light had not been fully investigated, but the solution was kept in amber bottles. There was no difficulty in getting the change of colour in following the directions.

The second paper was:—

The Variation of Specific Gravity and Refractive Index with Concentration of Camphor and Alcohol in Spiritus Camphoræ B.P.

By F. H. MILNER

[ABSTRACT]

SOLUTIONS of camphor in rectified spirit (carefully adjusted to contain 90 per cent. by volume of ethyl alcohol) were made containing from 8 up to 12 per cent. of camphor. These were made at 15.5° C. and the camphor was added to part of the alcohol so as to dissolve it. The volume was then made up to the graduation mark on the flask. The specific gravities of the solutions were determined at 15.5° C.

Camphor per cent.	Specific gravity 15.5°C	Difference per 0.5 per cent.
8	0.84434	—
8.5	0.84495	0.00061
9	0.84564	0.00069
9.5	0.84638	0.00074
10	0.84712	0.00074
10.5	0.84796	0.00084
11	0.84858	0.00062
11.5	0.84926	0.00068
12	0.85010	0.00084

The average difference per 0.5 per cent. of camphor is 0.00074. This difference of specific gravity is fairly constant.

The refractive index of each preparation was then determined, using a refractometer of the Abbé type. These are recorded below and were taken at 11.5° C.

Camphor per cent.	Refractive index 11.5°C.	Difference
8	1.3764	—
8.5	1.3769	0.0005
9	1.3773	0.0004
9.5	1.3777	0.0004
10	1.3781	0.0004
10.5	1.3788	0.0007
11	1.3794	0.0006
11.5	1.3800	0.0006
12	1.3807	0.0007

Refractive indices at 20° C. were obtained by conversion. The refractive index was obtained at 20.5° C. for the preparations containing 8, 9, 10, 11 and 12 per cent. of camphor. From the figures so obtained the coefficient of decrease of refractive index per degree rise in temperature was calculated and applied. The refractive indices at 20.5° are as follows:—

Camphor per cent.	Refractive index 20.5° C.	Difference	Refractive index 11.5° C.
8	1.3733	0.0031	1.3764
9	1.3743	0.0030	1.3773
10	1.3752	0.0029	1.3781
11	1.3761	0.0033	1.3794
12	1.3771	0.0036	1.3807

The average difference for 9° C. is 0.0032. Therefore the average difference per degree is 0.00035. All the refractive indices corrected to 20° C. are given below. Taking the refractive index of camphor as 1.4536 at 20° C. and that of alcohol 90 per cent. by volume as 1.3645 at 20° C. and assuming that refractive index is a purely additive property, the calculated refractive index would be 1.3734 at 20° C., which does not agree with the result actually obtained.

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Camphor per cent.	Refractive index at 20° C.	Difference per 0.5 per cent.
8	1.3734	—
8.5	1.3739	0.0005
9	1.3743	0.0004
9.5	1.3747	0.0004
10	1.3752	0.0005
10.5	1.3758	0.0007
11	1.3764	0.0006
11.5	1.3770	0.0006
12	1.3777	0.0007

The refractive indices differ only in the fourth place of decimals and are therefore not a very reliable standard of strength since the fourth place cannot be read very accurately on the Abbé refractometer. The average difference per 0.5 per cent. of camphor is seen to be 0.00054. The specific gravity, therefore, is the better criterion. Experiments were conducted in order to find out what difference was made if the alcoholic strength varied. Two strengths of alcohol were prepared, one 89 per cent. v/v and one 91 per cent. v/v. In each case a 10 per cent. w/v solution of camphor was made and the specific gravities and refractive indices of the resulting preparations were determined. The following table shows the results:—

Alcohol	Refractive index	Temperature °C.	Refractive index corrected to 20° C.	Specific gravity at 15.5° C.
89 per cent. v/v.	1.3787	9.5	1.3751	0.8496
	1.3785	10.5	1.3752	
	1.3777	12.5	1.3751	
	Average	—	1.3751	
91 per cent. v/v.	1.3790	9.75	1.3754	0.8438
	1.3789	10.0	1.3754	
	1.3786	10.5	1.3754	
	1.3780	12.5	1.3754	
	Average	—	1.3754	

From the above results it is possible to calculate the possible variations in specific gravity and refractive index of spirit of camphor, assuming that the camphor may vary from 9.5 to 10.5 per cent. w/v and the alcohol from 89 to 91 per cent. v/v. A solution of 10.5 per cent. w/v camphor in 89 per cent. v/v alcohol will have the highest s.g., viz., 0.8503, and a solution of 9.4 per cent. w/v camphor in 91 per cent. v/v alcohol will have the lowest s.g., viz., 0.8438. On the other hand, a solution of 10.5 per cent. w/v camphor in 91 per cent. v/v alcohol will have the highest refractive index, viz., 1.3759 at 20° C., and a solution of 9.5 per cent. w/v camphor in 89 per cent. v/v alcohol will have the lowest refractive index, viz., 1.3746 at 20° C. Allowing for a variation in camphor from 9.5 to 10.5 per cent. w/v and in the strength of alcohol from 89 to 91 per cent. v/v, the possible variations in spiritus camphoræ B.P. are: Specific gravity at 15.5° C., 0.8438 to 0.8503; refractive index at 20° C., 1.3746 to 1.3759. Since increase of water or loss of alcohol increases the specific gravity but reduces the refractive index, while loss of camphor diminishes both figures, a combination of the two determinations gives a useful means of testing this preparation.

DISCUSSION

Mr. BRINDLE asked if the experiments had been performed with synthetic camphor, as it seemed this figure would be useful.

Mr. CORFIELD said he noticed that throughout the paper the designation "B.P." was used in connection with the spirit of camphor, possibly a spirit of camphor which might go into the next Pharmacopœia. He wondered if there was any other spirit of camphor. It would be useful if the tests provided for a new spirit of camphor. He asked if the determination could be used for synthetic samples. It should be possible for the

practising pharmacist to make spirit of camphor from the alcohol in the pharmacy.

Mr. BREWIS asked if determination by means of the immersion refractometer would be better.

Mr. EVERS, in reply, said that the author had found in a preparation of synthetic camphor the same refractive index and specific gravity as in the natural product. Present B.P. spirit of camphor allows no limits whatever. Theoretically no B.P. spirit of camphor has ever been made. The optical rotation is not a satisfactory method of determining the camphor. He thought that use of an immersion refractometer would be better.

The next paper, also read in abstract by Mr. Evers, taken was:—

The Assay of Stramonium Leaves and Tincture of Stramonium

By CHARLES M. CAINES

[ABSTRACT]

THE method followed in the present investigation is similar to that adopted in a previous paper on the assay of belladonna leaves and tincture ("Quarterly Journal of Pharmacy and Pharmacology," 1928, 326). The processes investigated are:—(1) The B.P. 1914 process, as described for belladonna leaves. (2) The U.S.P. X process. (3) The D.A.B. VI process, as described for belladonna leaves. (4) Van Itallie's process, as described for belladonna leaves. (5) Eder's process, as described for belladonna leaves. (6) The author's process, as described for hyoscyamus leaves ("Quarterly Journal of Pharmacy," etc., 1929, 271). (7) The suggested modification of the B.P. method. After recapitulating the first six processes, the author gives the following suggested modification of the B.P. process.

Owing to trouble with the emulsification which occurred in the B.P. process, the following modification was tried, and found to overcome the difficulty. A weighed quantity of 10 gm. of stramonium leaves in No. 60 powder, is moistened, first with 5 c.c. of a mixture of ether 4 volumes and chloroform 1 volume, and then 2 c.c. of ammonia solution diluted with 3 c.c. of water are added. It is then packed carefully into a small percolator and percolated with the ether-chloroform mixture, until the alkaloids are completely extracted. The percolate is distilled until reduced in volume to 15 c.c., transferred to a separator and the flask washed with two quantities each of 5 c.c. of chloroform. The chloroformic liquid is extracted with successive portions of N/5 sulphuric acid solution until the alkaloids are removed. The combined acid extracts are washed with 10 c.c. of chloroform, which is removed and rejected, the liquid is made distinctly alkaline with ammonia solution, and the alkaloids are completely extracted by shaking with successive quantities of chloroform. The mixed chloroformic extracts are washed with 5 c.c. of water, and the chloroform is removed by distillation. The residue is dissolved successively in 3 c.c. of ether, and in 2 c.c. of absolute alcohol, the solvent being evaporated each time. The residue, dried for half an hour at a temperature of about 100° C., is dissolved in 1 c.c. of absolute alcohol, 5 c.c. of N/50 sulphuric acid solution is added, and the excess of acid is titrated with N/50 sodium hydroxide solution, using methyl red as indicator. 1 c.c. N/50 sulphuric acid solution = 0.005785 gm alkaloids.

Summary of Results

Method	Per cent. total alkaloids (as hyoscyamine)	
1. B.P. 14	0.23	0.23
2. U.S.P. X	0.23	
3. D.A.B. VI	0.32	(re-extracted 0.2)
4. Van Itallie's	0.092	
5. Eder's	0.184	
6. The author's	0.214	
7. Modified B.P.	0.255	0.25

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COMMENTARY ON METHODS

1. *The B.P. 1914 Process.*—Extraction of the alkaloids with the ether-chloroform mixture is rapid and complete. The objection to the process is the formation of troublesome emulsions on attempting to extract the alkaloids by shaking with an acid aqueous menstruum. The final chloroform extractions from the alkaline solution are generally troublesome owing to the formation of obstinate emulsions. The method of titration with $N/20$ solutions is not so satisfactory as solution of the alkaloidal residue in a measured excess of $N/50$ sulphuric acid solution and back-titration with $N/50$ sodium hydroxide solution using methyl red as an indicator. Cochineal as an indicator is not quite as satisfactory as methyl red.

2. *The U.S.P. X Method.*—The initial extraction of the alkaloids is rapid and complete. The separations are quick and, except for middle-layer formation, are fairly well defined. The final chloroform extractions do not, as a rule, emulsify. Solution of the alkaloidal residue in $N/10$ sulphuric acid solution and titration of the excess acid with $N/50$ sodium hydroxide is not as satisfactory as the use of $N/50$ solutions throughout.

3. *The D.A.B. VI Method.*—An aliquot part method employing such a volatile solvent as ether is not to be recommended. The use of so large a quantity as 7 gm. of ammonia solution is quite unnecessary. The abnormally high result, coupled with the low result on re-extraction, indicates that sufficient ammonia is retained by the ethereal solution to invalidate the process completely.

4. *Van Itallie's Method.*—The results by this method are extraordinarily low, and indicate that maceration for the time specified with alcohol (70 per cent.) does not, in the case of stramonium, succeed in extracting anything like the percentage of alkaloids present. The method of direct titration with $N/10$ sulphuric acid solution is not to be recommended.

5. *Eder's Method.*—The results are low. The innumerable weighings and the awkward quantities employed render the process tedious and open to grave experimental errors. The use of $N/10$ solutions for the final titrations introduces too large an error to recommend it.

6. *The Author's Method for Hyoscyamus Leaves.*—The results by this method are low, and show that in the case of stramonium leaves, the use of alcohol (70 per cent.) as a menstruum is not to be recommended. In this respect they confirm the results obtained by Van Itallie's method.

7. *The Suggested Modification of the B.P. Process.*—The initial extraction of the alkaloids is rapid and complete. Neither the extraction of the alkaloids from the chloroformic liquid nor the final chloroform extractions are accompanied by the formation of obstinate emulsions.

TINCTURE OF STRAMONIUM

The tincture of stramonium of the B.P. 1914 is a 1 in 5 tincture of the leaves made with alcohol (45 per cent.). The following process, which is a modification of the B.P. method for tinct. belladonnae, has been found useful for its assay:—100 c.c. of the tincture is evaporated in an evaporating basin on a water bath until it measures about 10 c.c., cooled and transferred to a separator. The dish is washed first with 2 c.c. of alcohol (45 per cent.) then with three quantities of 5 c.c. of water, followed by 2 c.c. of ammonia solution and finally with four quantities of 5 c.c. of chloroform. The mixture is well shaken and the chloroformic layer is separated. The extraction is repeated with two successive portions each of 10 c.c. of chloroform. The chloroformic solutions are completely extracted with $N/5$ sulphuric acid and the determination of alkaloids is completed as described above under the modified B.P. process. A tincture prepared strictly in accordance with the B.P. directions was found by the above method to contain 0.039 per cent. w/v of alkaloids, calculated as hyoscyamine.

Acknowledgment is accorded to Allen & Hanburys, Ltd., in whose laboratories the above work was carried out, and to Mr. Norman Evers for many useful suggestions.

DISCUSSION

Mr. FRANKLIN, after congratulating the author on a useful paper, inquired what is the best menstruum for the B.P. tincture.

Mr. DEANE presumed that the author's method had been tried on other samples of leaves; in the case of henbane there were differences between samples.

Mr. CORFIELD asked whether the leaves had been used as they appeared on the market, or whether after drying at 100°, as directed in the Pharmacopœia. He hoped that Mr. Evers would be able to fight for some alteration in that respect in the next B.P.

Mr. MCNEAL suggested that there might be variation in alkaloidal content between leaves of different sizes.

Mr. EVERS, in reply, pointed out that Mr. Caines had not obtained complete extraction of alkaloids with 70-per-cent. alcohol, and it might be that 45 per cent. was better. The method had been tried on at least two samples of leaves. There was considerable variation in samples; perhaps the results were largely a question of manipulation; the amount of drying and the age of the leaves were also said to influence emulsification. He had never heard of anyone drying leaves at 100°, and he hoped that there would be some alteration in this respect in the next B.P. He had no experience of variation due to difference in size of leaves.

The CHAIRMAN expressed the thanks of the meeting to the authors and to Mr. Evers.

The next three papers were presented in abstract by Mr. E. Lester Smith, whom the chairman welcomed as a new member of the Conference. These papers were:—

Studies in Emulsification

I.—The Examination and Analysis of Pharmaceutical Emulsions

By E. LESTER SMITH and GEORGE N. GRINLING

[ABSTRACT]

THIS paper deals primarily with emulsions intended for oral consumption, but many of the tests would be equally applicable to liniments and similar preparations in which the emulsifying agent is usually soap. The most obvious criterion of the quality of an emulsion is the degree of dispersion, i.e., the size of the oil globules. Since, however, the globules are seldom or never uniform in size, it becomes a matter of some difficulty to find a valid standard of comparison, and still more to translate this into a rapid routine test. A thorough comparison of two emulsions necessitates a size-frequency analysis. In a good emulsion most of the oil will be in the form of small and medium-sized globules. The size-frequency analysis is, however, a hopelessly tedious process. It may be done by measuring hundreds of globules, taken at random, by means of a microscope with eye-piece scale, or indirectly by measuring the change of density of the cream layer on standing, either method involving much time and calculating. (Two figures, to illustrate the former method, are given.) For routine testing a more rapid method is essential. At one time a practice was made of examining a dilution of the emulsion under a one-sixth or one-twelfth objective, against a calibrated eye-piece scale. This method, however, is still somewhat tedious and unsatisfactory. The arithmetical mean diameter is not a very useful figure as a criterion of the subdivision of the oil phase. This difficulty can be overcome to a large extent by taking a mean, not of the diameters of the globules, but of their volumes. In this way a few large globules, which have little effect on the mean diameter, considerably affect the mean volume, while large numbers of tiny globules have no more than their due effect. The mean volume of a globule in mils or its reciprocal, the number of globules into which one mil of oil is subdivided, is in fact the most satisfactory single criterion of the

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efficiency of emulsification. The value can be calculated from the measured diameter of a large number of globules, but the arithmetic involved is tedious, and the probable error increased threefold by the cube introduced. Fortunately this can be avoided by a different technique in which globules are counted directly instead of being measured. The Thoma type of haemocytometer, which is used by the authors of this paper, consists of a microscope slide, bearing a central portion sunk 0.10 mm. below the surface of the slide, and ruled into squares 0.0025 mm. in area. This portion is surrounded by an annular well into which superfluous liquid can overflow. A weighed amount of the emulsion is diluted to a known convenient volume, and a few drops of the well-mixed dilution placed on the central portion of the haemocytometer, and covered with a thick cover-slip, ground truly plane. The number of globules in 0.0025 mm. of the dilution can evidently be obtained directly by counting the globules in, say, twenty squares and taking the mean. The technique is as follows:—

1 gm. of the emulsion is weighed out, mixed with about 25 mils of 25-per-cent. gum acacia mucilage, then diluted to such a volume that one square will contain 10 to 20 globules (25 c.e. to 1,000 c.e. according to the emulsion), and the dilution examined on the Thoma haemocytometer with a $\frac{1}{8}$ -inch objective and No. 4 eye-piece. Not less than 10 squares are counted, taking care not to miss the smallest globules, and so to vary the focus that the entire depth of field is explored. In order to obtain a number of reasonable dimensions, the degree of emulsification (H) is expressed as the number of millions of globules into which 1 mm.³ of the oil is subdivided: multiplication by 10^{-9} gives globules per cm³. This number is thus independent of the concentration of the emulsion. H is evidently the product of the number of globules per square (n), $4,000 \times 10^{-6}$, the volume to which 1 gm. of emulsion is diluted and the weight of emulsion which contains 1 mil of oil. Thus a particular emulsion containing 30 per cent. of oil, 1 grain is diluted to 1,000 mils and the expression becomes:—

$$H = n \times 4,000 \times 10^3 \times 1,000 \times 3.27$$

$$H = 13.1 n$$

If the minimum value of H for this product is fixed at 200, by substitution in the above equation, we have $n=15$. In other words, it would only be necessary to determine whether a batch of emulsion gives fifteen or more globules per square under the conditions specified, to know whether it may be passed as satisfactory. A figure for the average diameter of the globules can be obtained from H by the formula:—

$$D (= \text{diameter in } \mu) = 10 \times \sqrt[3]{\frac{6}{\pi H}}$$

It is not the arithmetical mean diameter, but is the same as the figure obtained by cubing the measured diameter of many globules, and taking the cube root of the average. It may be termed the "root mean cube diameter," and is in general larger than the arithmetical mean. It also represents the diameter the globules would have if they were uniform in size and the same in number as in the emulsion examined. The probable error is reduced threefold by the cube root involved in the calculation, and should be well within ± 5 per cent.

The value of H is not only an index of the efficiency of emulsification, but, for an emulsion of any given composition, is a measure of the extent to which creaming will occur on standing. A more direct and obvious way of discovering this is to centrifuge a sample of the emulsion. It is open to question, even on theoretical grounds, whether the emulsion will behave in the same way in the centrifuge and on standing for a period such that the product of time and acceleration is the same in the two cases. Nevertheless the authors have found general agreement between the indications of the centrifuge tests and the behaviour of the packed emulsions in keeping tests.

The analysis of emulsions of unknown composition is fairly straightforward, but certain rapid methods which have been adopted may be of interest. The oil can

be extracted more or less quantitatively by gently shaking the emulsion with a large volume of ether, after slight dilution; it is difficult to avoid emulsifying part of the ether, however, and complete extraction is not easy. For estimation of oil content the best means appears to be the Werner-Schmidt method used in milk analysis. An emulsifying agent will usually be gum, protein or soap. The latter is detected by acidification when the emulsion breaks instantly, and may be estimated by extracting the oil and fatty acid with ether, and determining the acid value of the extracted material.

Casein is detected by curdling of the emulsion on acidification. The authors give a method for estimating gums and protein. Sugar, if present, is partly precipitated as a sticky mass. Most salts would also be precipitated and weighed as gum, but may be detected by ashing the precipitate. In some cases, it is possible to identify the emulsifying agent by testing the precipitated material. Proteins, for example, give a characteristic odour on ignition, and many characteristic reactions. Irish moss gives a flocculent precipitate with benzidine chloride, and may be estimated if necessary with this reagent. The more usual mixture of gum acacia and gum tragacanth is less easy to deal with. The best method is probably to redissolve the precipitated gums in a convenient volume of water, and determine the viscosity of the resulting mucilage. This is then compared with mucilage made from mixtures of the two gums, the total quantity being equal to that present in the test mucilage. For measuring the viscosity of mucilages and emulsions the simplest possible apparatus was used and accurate results were obtained. A description of the apparatus follows. Tables and illustrations are given throughout the paper.

II—Some Observations on the Manufacture of Pharmaceutical Emulsions

By E. LESTER SMITH and VIOLET HAZLEY

[ABSTRACT]

IN the course of preparing medicinal emulsions, there are numerous difficulties to overcome. The following observations, based on experience in combating such difficulties, are presented in the hope that they may prove of service. The first point is the choice of an emulsifying agent. There is little doubt that both for ease of emulsification and for fineness of the resulting emulsion, soap is the best agent. Soap, however, is obviously unsuitable as an ingredient of an emulsion for internal use. Of the proteins, gelatin, albumin, and casein are available. Gelatin cannot be used in high enough concentration to produce a stable emulsion without causing the preparation to gel. Casein seemed a promising emulsifier, but it was decided that its use was too risky and must be abandoned. In general, protein emulsifiers tend to convert emulsions into good culture media for bacteria, and involve the use of unduly large amounts of preservative. No large-scale tests had been made by the authors with albumin as an emulsifying agent. There remain the gums, their value for emulsion-making testified by generations of pharmacists. It soon appeared that the only one of these which would make really good emulsions was gum acacia. Tragacanth alone is of little value; it produces extremely coarse emulsions, which do not break, mainly because the mucilage is too thick for the globules to approach and coalesce. Gum acacia, on the other hand, is a true emulsifying agent, stabilising by means of a colloidal protective film on the oil globules. Acacia emulsions, however, owing to their comparatively low viscosity, cream rapidly unless they are extremely rich in gum and oil or have been homogenised. The addition of tragacanth does not aid the dispersion (it may even hinder it) but retards creaming by increasing the viscosity. Other so-called emulsifying agents act in the same way, e.g., agar-agar, pectin, Irish moss, which alone give viscous but coarse emulsions. Creaming is one of the principal faults of pharmaceutical emul-

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sions. In the attempt to overcome this difficulty many manufacturers have produced emulsions so thick they will scarcely come out of the bottle. A consideration of the factors involved in this phenomenon of creaming points the way to a much more satisfactory solution of the problem. Consider first an isolated oil globule suspended in the aqueous medium. Its motion is determined by Stokes law, i.e., the speed with which it will rise is proportional to the difference in density between the oil and aqueous phase, and to the square of the radius of the globule, and inversely proportional to the viscosity of the dispersion medium. In order to minimise creaming, we must decrease either of the first two factors, or increase the viscosity. The density of the aqueous phase can only be decreased by the addition of organic liquids such as alcohol, which are usually undesirable; on the other hand, the addition of sugar to emulsions, which is often practised, leads to an increase in the density, which may easily double the density factor promoting creaming, though the concurrent viscosity increase tends in the opposite direction. A factor which is more easily controlled, and which is of great importance, is the size of the oil globules. If the average diameter can be reduced to a half, the velocity of the globules is reduced to a quarter, so that a given degree of creaming will require four times as long to occur. Every effort should therefore be made to break down the oil globules as much as possible.

Conditions in a concentrated emulsion are actually not so simple as in the case we have considered. A large globule, rising in the emulsion, collides with smaller ones moving less rapidly; three things may then happen: (1) It may push them aside and travel alone; (2) in certain cases they may adhere without losing their identity; or (3) they may coalesce into one globule, if the film is easily ruptured. A fourth possibility is that the thickening agent may set to a loose gel entraining the oil globules, after which syneresis occurs, i.e., separation of water from the gel; being heavier than the gel *plus* oil, the water appears at the bottom of the vessel, but sometimes there is evidence of shrinking away from the sides also. In the case of plain acacia emulsions there is evidence that the first of the above possibilities controls the nature of the creaming. The second possibility, adhesion of the globules at the protecting envelope (clumping or clotting), occurs notably in the case of milk. Unheated milk creams very much more rapidly than calculations from the viscosity and size of globules would indicate. This is due to clumping of large numbers of fat globules, which then behave as one big globule, and so rise more quickly. The possibility of clumping must be conditioned by the nature of the absorbed protein film. Heated milk does not form clumps, or only small ones, and so creams less rapidly, but the addition of colloides, such as gum acacia, gura tragacanth, gelatin, or albumin, restores the ability to clump and rapid creaming ensues. We incline to the suggestion already made that gelling and syneresis account better for the rapid creaming of emulsions containing pectin and agar-agar. Some experiments which illustrate these points were quoted at this stage.

Another factor which affects the viscosity of an emulsion is the degree of dispersion; homogenisation, for example, increases both dispersion and viscosity. The influence of the percentage of oil in an emulsion, on creaming, has not yet been mentioned. The authors have made no direct comparisons, but their general experience has confirmed the expectation that other conditions being the same, the less oil an emulsion contains, the more readily it creams. In order that an emulsion of low viscosity should exhibit no visible creaming, however, it would apparently require to contain at least 75 per cent. of oil.

Having decided the nature and quantity of emulsifying agents necessary to prepare an emulsion containing a given percentage of the desired oil, and having fixed the medicants, flavouring agents and preservative, it is next necessary to settle the method of preparation. On the large scale, using mechanical mixing, the time and labour involved in this operation are of little con-

sequence. "Since all emulsions are homogenised, it has been less important to get the best possible emulsion by mixing alone, although within limits this appears to be an essential preliminary. Care is always taken to prepare a "primary emulsion" so rich in oil as to "click" in the mixer, and to beat this well, prior to further dilution. This seems to be sound policy. For batches of a few gallons the authors have found that a rotating paddle, the shaft of which has an eccentric motion, makes for very effective beating of every particle of the emulsion. Engineering difficulties prohibited the use of this principle when manufactured on a large scale, but a sturdy rotating paddle, with very small clearance between it and the walls of the vessel, has proved satisfactory. On this scale, mucilage made from gum acacia tears is always used in preference to powdered gum. The preparation is more troublesome, but it gives a clearer product besides being less expensive. Reasonable care has to be exercised in adding the oil, especially towards the end of the operation. Too rapid addition, at this stage, is liable to cause inversion of the emulsion with dramatic suddenness.

After addition of all the oil the remainder of the water is gradually added, and the emulsion homogenised. Despite considerable experience with various machines, the authors are still looking for the perfect homogeniser. In one type they have used largely the liquid flows into the centre of a disc, revolving at 6,000 r.p.m. with a small and adjustable clearance from a fixed disc; centrifugal force throws the liquid out from the periphery, after subjecting it to considerable shearing action. A small model gave reasonably good results. A larger model of the same machine was somewhat less satisfactory, and was replaced, with appreciable improvement, by a new machine in which the liquid is fed to the centre of two very obtuse-angled cones, facing one another, and revolving with different speeds in opposite directions. The faces of the cones are provided with rows of studs, and their circumferences are practically in contact. The liquid is flung out centrifugally from the periphery, after suffering considerable beating and shearing. Another type was tested, in which the action consists of a series of inter-meshed cog-wheels. While requiring considerably less power, this machine was definitely less satisfactory, producing a number of very small globules, but leaving the bulk of the globules untouched. It is necessary to pass the emulsion twice or even three times through either of the machines employed. Even then the dispersion is neither so fine nor so even as that of samples of homogenised milk or cream which have been examined, produced presumably with a type of homogeniser in which the liquid is forced, at high pressure, through an agate valve. It is perhaps significant that of the large number of commercial emulsions examined, other than milk, none has been found with a higher dispersion than emulsions prepared as described above, while some which apparently had not been homogenised were very much inferior. The degree of dispersion attainable by a given machine is certainly not independent of the amount of gum. In fact, so far as the authors' experiments go, dispersion would appear to be proportional to some function of the ratio of gum to oil in the emulsion. (The authors gave experiments to illustrate this point.)

CONCLUSIONS

In recapitulation, the authors stated that in their experience, the following are the requisites for a good pharmaceutical emulsion. Gum acacia is the safest emulsifying agent to use for edible emulsions. Quantity to be regulated by degree of dispersion desired, and length of time the emulsion is required to keep; surface demulsification occurs after a time with small proportions of emulsifier. Sufficient thickening agent to give the viscosity desired, or necessary to delay creaming. Sugar is to be avoided since it increases the density of the dispersion medium, also substances which form gels. Gum tragacanth and Irish moss mucilage appear to be the best, and about equally effec-

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tive. Homogenisation to be as efficient as possible. High dispersion improves the quality and appearance of the emulsion and greatly delays creaming.

Throughout the paper tables were given.

III—A Factor Inhibiting the Emulsification of Cod-Liver Oil

By E. LESTER SMITH

[ABSTRACT]

DURING some experiments on the preparation of cod-liver oil emulsions with a minimum of emulsifying agent, considerable trouble was experienced with certain batches of cod-liver oil which caused the emulsion to invert during the course of preparation. On investigation it appeared to be due to the presence in the oil of some unknown substance capable of stabilising emulsions of the water-in-oil type. It was observed that a batch of satisfactory refined oil developed strong "anti-emulsifying properties" after it had stood for some weeks in an open can. This pointed to the possibility that the "anti-emulsifying substance" was a product of the oxidation or drying of the oil. In order to test this, a thin layer of satisfactory oil was exposed to the air for six weeks in a crystallising dish. By this time it had dried to a gummy mass; this when stirred with water gave an exceedingly stable white emulsion of ointment-like consistency. Moreover, as little as one part of this oxidised oil mixed with a hundred parts of satisfactory oil rendered it capable of emulsifying about twice its own volume of water to a creamy emulsion stable for some hours at least.

An attempt was made to standardise a method of determining the extent to which this oxidation had proceeded, by stirring water with the oil and estimating the stability of the resulting emulsion to standing or centrifuging. This procedure was abandoned in favour of the measurement of the interfacial tension between the oil and water. For this purpose a small pipette is required, having very fine capillary constrictions above and below the bulb, but terminating in a fairly coarse jet. After the pipette has been filled to the upper constriction with distilled water, and the outside wiped dry, the jet is lowered into a beaker of the oil to be examined and the pipette clamped in position; by blowing gently the flow of water from the pipette is begun, after which it is allowed to proceed under the action of gravity. The number of drops formed while the pipette empties to the lower capillary is counted. Evidently the more drops that are formed the greater the tendency of water to disperse in the oil; the drop number is, in fact, inversely proportional to the surface tension. The most useful value to record is the number of drops divided by the volume of the pipette, i.e., the number of drops per mil, which is the reciprocal of the drop weight. The higher this number the more likely is the oil to form water-in-oil emulsions, and the less suitable is it for making oil-in-water emulsions. There has been general agreement between the tendency of oil-in-water emulsions to invert and the drop number of the oil; a determination of the drop number has thus proved a useful criterion of the suitability of any given cod-liver oil for the manufacture of emulsions.

DISCUSSION

The CHAIRMAN, in inviting discussion, pointed out that the authors of these papers had supplied valuable subject-matter.

Mr. EVERS, after congratulating the author, inquired why, if sugar was to be avoided, malt extract made such a good emulsion with cod-liver oil, and desired Mr. Smith's views on the relative difficulty of making emulsions of liquid paraffin and of cod-liver oil.

Mr. BERRY added his congratulations, and asked whether the authors had considered mucilage of starch as an accessory in increasing viscosity. Much acacia was wasted in the usual formulas. An important factor was the proportion of the disperse phase: it could negative the Stokes law. He had never found inversion with

mucilage of acacia, though he had with powdered acacia. He wondered whether Mr. Smith had experimented with different varieties of soap.

Mr. FORSTER referred to the new Formulary liniment made with turpentine, soft soap and ammonium chloride, and asked whether a permanent liniment could be produced.

Mr. SCHOLDS desired to know if any authority had established the superior digestibility of a cod-liver oil emulsion with fine globules as compared with one with coarser globules.

Mr. McNEAL asked how much formalin was used as a preservative.

Mr. RAE inquired whether any work had been done on the action of peroxidase on the vitamin-content of cod-liver oil.

Replying, Mr. SMITH suggested that the answer to the question on malt extract and cod-liver oil lay chiefly in the fact that their refractive indices were much the same. A trace of oxidised cod-liver oil in sound oil could cause difficulty in making an emulsion. He had not tried starch mucilage, nor the respective merits of sodium and potassium soaps. An ammonium soap hydrolyses to a greater extent than a sodium or potassium soap, and this fact might have a bearing on the linimentum album mentioned. He had made no experiments on the digestibility of emulsions, nor did he know the amount of formalin used. He believed the work was available indicating the destruction of vitamin-content by peroxidase.

The CHAIRMAN, in thanking the authors, added that Mr. Smith had won his spurs, and that really useful points such as he had given were often lacking in textbooks. The session was adjourned to the following day.

Science Section

Wednesday Morning

The attendance during the first hour of Wednesday morning's science session was augmented by the presence of several delegates who, after an hour, left for a private discussion on the Departmental Committee's Report, adjourned from Tuesday afternoon. Apart from this, the number present was distinctly above the average. Mr. Humphrey again presided, and early in the proceedings the vice-president and Mr. Peck, who had been representing the Pharmaceutical Society in Sweden, joined the audience.

The first paper, read by Mr. T. E. Wallis, in the absence of the author, was entitled:—

Crude Fibre: An Investigation of the Dutch Process

By SAMUEL GOLDBERG

[ABSTRACT]

It has been customary to make crude fibre for three distinct purposes. The processes used for these purposes have been essentially the same in principle and in method of operation. In Holland, however, a special process, using nitric acid in place of sulphuric acid and employing considerably stronger acid and alkali, has been developed for making crude fibres intended for microscopical examination. Inasmuch as the Dutch process can be carried out very rapidly, it seemed worthy of being investigated to determine whether it could be used successfully as a method for the quantitative estimation of fibre. The so-called Dutch process is a modification of a method of making crude fibre, introduced by Benecke in 1886. Some years later, about 1894, the method was modified by substituting 10-per-cent. nitric acid and 2.5-per-cent. caustic soda for the much stronger acids and alkali previously used. The procedure, which was finally adopted and was described by Bruijning in 1915, consisted in weighing 2 grams of the feeding cake sample and mixing it with 50 c.c. of 10-per-cent. nitric acid in a casserole; the contents were

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then boiled for thirty seconds, washed with cold water followed by hot water, and strained through a specially constructed filter. The operation was then repeated with 50 c.c. of a 2.5-per-cent. solution of sodium hydroxide, and the material was ready for microscopical use.

For the purpose of my experiments I have selected podophyllum rhizome because I wished to discover whether or no it might be possible to distinguish between the American and Indian podophyllum rhizomes by making use of their crude fibre content. Preliminary experiments gave the following four results, viz.: 11.38 per cent., 13.8 per cent., 12.48 per cent., and 12.25 per cent. The large variation in these figures made it evident that the Dutch process could not be utilised in its present form as a satisfactory method for the quantitative determination of crude fibre. It seemed probable that the largest errors were introduced as a result of the very short period, thirty seconds, during which the ebullition was maintained. This factor was therefore first modified by extending the heating time to three minutes, experiments being carried out under identical conditions otherwise. The resulting figures for the crude fibre percentage were considerably improved. On further reflection it seemed probable that considerable variations would be produced by the use of a naked flame and an open dish. It was sought to eliminate these two uncertainties by using a water bath and a conical flask, with a funnel in its neck. Four determinations were carried out, the heating period being a quarter of an hour, during which the contents of the flask were shaken from time to time. The percentages of crude fibre obtained were: 9.68, 9.932, 8.92, 9.2. Loss of water and consequent strengthening of the solutions by evaporation is a possible cause of the variations. The loss observed was 0.2 gm., an amount which cannot appreciably affect the concentration of the solutions. It is therefore evident that losses by evaporation have no effect in producing the observed variations. An experiment was next carried out to test the completeness of the removal of the material from the filter cloth. In order to test the efficiency of the filtering media, it was necessary to ascertain whether any of the drug was passing through the filtering cloth during filtration. The amount of drug lost in filtration was never more than 0.25 per cent., a quantity which is negligible. There still remained for investigation any variation that might result from differences in the vigour and frequency of shaking of the flask while being heated in the boiling water bath. (A diagram of the apparatus is given by the author.) Two determinations were made without agitation of the flask, and the results obtained were 11.33 per cent. and 10.93 per cent. Next, two exactly similar experiments were carried out, but the flask was shaken continuously by hand during the whole of the time, and the two results were 8.97 per cent. and 8.85 per cent. These figures prove conclusively that continuous shaking of the flask lowers the results appreciably.

A further difficulty that had presented itself during the course of these experiments was the very slow rate of filtration of the fibre after treatment with alkali, an effect which is due to the swelling action of the alkali upon the cellulose walls. It was thought possible that an improvement might be effected by a final treatment of the fibre with a very dilute acid. A 1-per-cent. nitric acid was used for this purpose. The amounts of crude fibre found in two such experiments were 9.6 and 10.7 per cent. respectively. A further experiment was made using 1-per-cent. sulphuric acid in place of the 1-per-cent. nitric acid, and the amounts of crude fibre found were: 8.73 per cent., 8.72 per cent., and 8.65 per cent., showing that the use of dilute sulphuric acid is to be preferred.

Since the tissues of a drug like podophyllum rhizome consist mainly of lignified and cellulosic tissues, it was decided to make experiments upon each of these tissues separately, and so endeavour to obtain some definite evidence as to the actions which take place during the preparation of the crude fibre. Qualitative experiments

were first carried out using pine wood sections for the lignified material and date stone sections for the cellulosic material. (A table is given by the author.) These qualitative experiments show clearly that dilute nitric acid has an action upon lignified tissues quite different from that of sulphuric acid. Quantitative experiments were next planned with the object of investigating the difference in behaviour of the 1-per-cent. solutions of nitric and sulphuric acids used in the third operation of the process, finally adopted for making the crude fibre. The experiments gave valuable confirmatory evidence of the accuracy of the conclusions drawn from the qualitative work. (The author gives a table.)

The difference in the action of sulphuric acid and of nitric acid upon the lignified tissue is clearly due to the composition of the middle lamella, because nitric acid produces easy separation of the wood into its constituent cells while sulphuric acid has no such disintegrating action. Diluted sulphuric acid does not decompose lignin; and consequently this tissue remains intact and the amount of residue is larger. Turning to the cellulose tissue from date stones, nitric and sulphuric acids leave residues of almost the same weight and yet of very different composition. By both treatments the middle lamella is destroyed. Figures seem to indicate that the nitric acid had formed a large proportion of insoluble acid of the nature of mucic acid. (The author gives a table.)

Pectin when oxidised to mucic acid would theoretically give an increase in weight of 30.4 per cent., a figure which comes very near to that obtained with the date stones. One is therefore justified in stating that it is the pectin content of the date stone endosperm to which is due the increase in weight in the third operation of preparing a crude fibre from date stones using 1-per-cent. nitric acid for the purpose. One may also conclude, in the case of the podophyllum powder used for the first experiments, that the increase of 15.6 per cent. in weight after the final treatment with 1-per-cent. nitric acid is due to the oxidation of pectin contained in the cellulosic tissues of the rhizome.

SUMMARY

(1) The Dutch process for the preparation of a crude fibre, using 10-per-cent. nitric acid and 2.5-per-cent. caustic alkali, in the form in which it is advocated by Bruijning and modified by Wallis, is well suited for microscopical work, for which purpose it was originally designed.

(2) When the process is applied to obtain quantitative results, they were found to show too great a variation to be considered sufficiently reliable for the calculation of percentages of the materials used.

(3) It is shown that reliable results may be obtained by regulating the temperature and the rate of stirring and by lengthening the time of digestion.

(4) The use of nitric acid in place of sulphuric acid appears to be preferable because it disintegrates both lignified and cellulosic materials whereas sulphuric acid disintegrates only the cellulosic tissues.

(5) Treatment with acid followed by alkali produces a crude fibre, which has been so much swollen by the action of the alkali that filtration and washing in a Gooch crucible is rendered very slow and tedious. This difficulty has been overcome by introducing a third and final treatment with very dilute acid which has the effect of reducing the volume of the fibre and rendering the final filtration and washing both easy and rapid.

(6) For the final treatment 1-per-cent. sulphuric acid has been chosen in preference to 1-per-cent. nitric acid because sulphuric acid makes no alteration in the weight of the crude fibre, whereas 1-per-cent. nitric acid always produces a marked increase in weight.

(7) The cause of this increase has been investigated and is shown to be due to the action of the nitric acid upon the cellulosic constituents which have been altered by the previous action of caustic alkali; the action results in the formation of mucic acid.

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DISCUSSION

Mr. MARRIS said it did not perhaps occur to students how much work of this nature could be done in their spare time.

Mr. BRINDLE said the paper was a very valuable one. He would like to have seen some comparison of this process with the official one. The present process seemed to have advantages.

Mr. WALLIS, in reply, said he understood some work was being done as suggested by Mr. Brindle.

The next paper, read by Mr. Beardsley, was:—

The Capsicum Tincture of the B.P.

By W. J. BEARDSLEY and F. J. BOLTON

[ABSTRACT]

In cold weather many samples of tinctura capsici throw down a deposit of fatty matter (and become very unsightly in appearance) which does not readily redissolve when the tincture is put in a warm place. An investigation was carried out to determine the conditions under which the tincture deposited fat, and to find the best way of making a preparation which would remain clear at low temperatures. After references to previous investigators, the authors report the effect of making the tincture at different temperatures. Two samples were made up from the same batch of capsicum, which was in the form of No. 36 powder. A was macerated for seven days in a warm cupboard of temperature 25° to 30° C., while B was kept out of doors at a time when the temperature did not rise above 10° C. A table shows that the tincture made at the higher temperature contained more extractive matter, and it also deposited fat at a higher temperature than that made in the cold, which means that it would be less likely to remain clear on storage. On cooling to 0° C. both samples deposited to about the same extent. Other results obtained are tabulated as follows:—

Sample of capsicum	Tincture	Menstruum used	Total solids Per cent. w/v.	Colour	Effect on cooling
1	A	Spiritus ætheris	1.22	Red	Very cloudy at 0°C.
	B	Alcohol, 90%	1.40	Yellowish-red	Very slightly cloudy at 0°C.
2	C	Alcohol, 70%	1.62	Reddish-yellow	Very cloudy at 0°C.
	D	Alcohol, 60%	1.48	Reddish-yellow	Very cloudy at 0°C.
	E	Alcohol, 45%	1.22	More yellow	Very cloudy at 0°C.
	F	Alcohol, 90%	0.96	Yellowish-red	Very cloudy at 0°C.
	G	Alcohol, 70%	1.32	Reddish-yellow	Not cloudy at 0°C.
	H	Alcohol, 60%	1.51	Reddish-yellow	Not cloudy at 0°C.
	I	Alcohol, 45%	1.32	More yellow	Not cloudy at 0°C.

The outcome of further discussion of possible methods is a recommendation to prepare the tincture with a weak alcohol, and to bring it up to the required strength by the addition of rectified spirit. The small quantity of fat extracted is then kept in solution by the stronger spirit. A number of samples were made in this way. On the whole it seems better to make the tincture up to 70-per-cent. spirit. Several samples were made by this method, using different batches of capsicum. Their colour was a little lighter than the B.P. tincture, and they were not quite so strongly pungent when assayed by the U.S.P. method. These differences, however, were so slight as to be negligible, and were outweighed by their improved appearance at low temperatures. They remained perfectly clear at 3° C, which is quite low enough for normal storage purposes; and only deposited very slightly at 0° C. It seems that the most convenient formula for the tincture would be:—

Capsicum 7.5 gm.
Alcohol (60 per cent.) 100 c.c.

Macerate, percolate and press the marc. Add to the resulting liquid one-half its volume of 90-per-cent. alcohol.

The work of this paper was carried out in the laboratory of Thomas Hodgkinson, Prestons & King.

DISCUSSION

The CHAIRMAN, in asking for comments on the paper, pointed out that it confirmed Gerrard's estimate of the best alcoholic strength for extraction.

Mr. DORR remarked that the strength of alcohol in tinctures was largely a traditional matter. Possibly it would be better to extract capsicum with a strong alcohol and then dilute to any approved percentage.

Mr. MARRIS gave an experience of finding olive oil in bruised capsicum fruit: it had been added by workmen to ease the labour of grinding. (Laughter.)

Mr. BREWIS inquired whether any attempt had been made to determine the relative proportions of oil in the seeds and the dissepiment. An attempt might be made to remove the seeds before making the tincture. Capsicums differed in pungency.

Mr. FRANKLIN welcomed the ingenious idea of the authors.

Mr. DEANE agreed that tincture of capsicum gives a good deal of trouble if made in the summer. The authors' suggestion was good, especially as chillies vary very much in the way they throw down.

Mr. BULL inquired whether freezing takes away any of the pungent principle.

Dr. BRYANT suggested the experimental addition of a small amount of alkali.

Mr. BEARDSLEY, replying to the points raised, said there were many difficulties in the use of industrial spirit: it might ruin some principle and alter colour. He knew of the olive oil dodge. (Laughter.) The pungent principle was chiefly in the epidermal cells, and it was not removed to any extent in freezing. The addition of alkali had been tried, but was not satisfactory.

The CHAIRMAN expressed the thanks of the audience.

The next paper taken was:—

Diatomite: Its Analysis and Use in Pharmacy

By N. INGRAM HENDEY

[ABSTRACT]

WITH the ever-increasing field of application for diatomite in applied science, it was thought that a series of analyses should be carried out on some of the various types imported into this country, with a view to establishing workable laboratory methods, whereby the purity and nature of the various types could be determined and to ascertain as far as possible the suitability of a particular type for a specific purpose. The work is not in any way exhaustive. The literature of the subject is rather scarce and is spread throughout a number of technical journals in such a way as to be inaccessible to many. Diatomite is the most recent name to be applied to what has been generally known as kieselguhr; other names being infusorial earth, tripolite, tripoli, molera, raudannite, ceyssatite, tellurine, white peat, fossil flour, diatomaceous earth. The deposits may be divided into two classes, marine and fresh water, and vary considerably. The crude material is mined by the open quarry system, the large blocks are arranged in stacks and allowed to air dry; when mined in this fashion the diatomite contains from 25 to 40 per cent, of moisture and requires a period of approximately six to eight weeks of air-drying in order to reduce the moisture content to 5 or 6 per cent. The blocks are then conveyed to a mill where they are crushed and graded by means of air separators of the cyclone type; sometimes the blocks are exported in the crude state. Diatomite, as imported into this country, occurs in two forms, crude block and powder. The colour of the powder varies considerably. Diatomite is mentioned officially under the name of "Kieselguhr" in the British Pharmaceutical Codex, 1923, which states that it "should be incinerated, washed with hydrochloric acid, then with water and dried." "In this

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state it is practically pure silica." Unfortunately the most vital point is overlooked, that is, that the high silica content must be all diatomaceous silica and not inorganic crystalline silica.

CHEMICAL ANALYSIS

P. A. Boeck gives a useful method of analysis:—

"One half gm. sample is weighed in a platinum crucible, heated to redness to drive off organic matter, cooled, moistened with a small amount of distilled water, about four drops of dilute sulphuric acid and 1 c.c. of hydrofluoric acid added. Heat on a sand bath to fumes and repeat the operation until decomposition is complete, after which the crucible is ignited strongly until constant in weight. The loss consists of moisture, organic matter, combined water and silica. Of these, the moisture is determined on a separate sample at 105° C. and the organic matter and combined water are determined on the same sample as 'Loss on Ignition' by continued strong heating until constant weight is obtained. The values are then deducted from the complete loss, giving the silica content of the sample. The residue from the hydrofluoric acid treatment is fused with sodium and potassium carbonates, dissolved in dilute hydrochloric acid, oxidised with bromine water and the hydroxides precipitated by means of ammonia, which are filtered off, ignited and weighed. In the precipitate the iron, aluminium and titanium oxides are determined by any of the well-known methods and the lime and magnesia are determined in the filtrate."

PHYSICAL ANALYSIS

It is of utmost importance that a physical analysis be carried out on all samples of diatomite before use. As there are no scientifically accurate standards upon which to base this analysis, several workers would obtain different results with the same sample, but if the individual worker always uses the same apparatus and methods, the results will be relatively accurate. The colour of the various samples varies considerably, but, if pure, is white. The colour after calcination is a useful guide of the iron content; its presence is marked by a pink coloration which may even be ochre in some samples, according to the amount of iron. Calcination destroys all organic matter, therefore it is quite a simple matter to convert what may appear to be a poor sample into a good one. The moisture content varies from 1 to 60 per cent., and may be determined by drying a weighed quantity for six hours at 105° C., or until the weight is constant.

The grit estimation is most important, for, as may be seen by a table given by the author, it tends to vary from 1 to 50 per cent., and is considered most objectionable for whatever use the diatomite is intended. The simplest method of the grit estimation is by elutriation of a weighed sample. 5 gm. is placed in a large conical flask of 500-c.c. capacity, half filled with water and shaken well to ensure that all the small lumps are broken up, then set aside to rest for half a minute. The water is then carefully poured off, carrying with it the light diatom material. The washings are continued, the time of sedimentation being decreased gradually, until the washings no longer assume a milky or opalescent appearance. A microscopical examination of the sediment should then be made and the washings continued if any but the largest diatoms remain. When the sediment is found to consist wholly of grit, it should be dried at 105° C. until the weight is constant, when the percentage may be determined. The porosity of the sample is an important consideration and serves as a guide to the quality of the material, for it is on this character that the main uses of diatomite depend. A weighed sample of the material previously dried at 105° C. is placed in a tared evaporating dish and water is stirred in with a glass rod, a few drops at a time; the addition of water to be stopped just before the mixture ceases to stand up and begins to develop the power of running. The true absorption point can be accurately judged after a little experience. The mixture is again weighed and the amount of water absorbed estimated. The porosity can be expressed in terms per cent., or as the coefficient of absorption; that is, the weight of water absorbed

by 1 gm. of the material. The coefficient of absorption generally varies inversely as the apparent density.

To estimate the apparent density, a quantity of the sample previously dried at 105° C. is passed through a No. 30 sieve and poured into a weighed glass cylinder, having a diameter of 2 cm. and being 6 cm. in height. The powder is then gently tapped down so as no large air interspaces remain, the surplus being cut off at the top of the cylinder with a piece of stiff cardboard. The weight of material required to fill the glass is then determined and divided by the weight of an equal volume of water. The amount of rodding or tapping allowed must be the same in all cases, and will necessarily vary with different workers. If the estimation is repeated a few times and the average taken, the result will be tolerably accurate. In the case of estimating the apparent density of the crude block, the following procedure is adopted. A piece of the crude material is shaped conveniently with a knife and weighed, then dried, and again weighed. The dried lump is then dipped into melted paraffin, which will render it impervious to water. Applying the Archimedeian principle, the weight of water displaced may be estimated and the apparent density of the crude block, as originally cut and as subsequently dried, may be estimated.

MICROSCOPICAL ANALYSIS

The most essential and infallible test for diatomite is microscopical. It is necessary that strewn slides be made and mounted in the correct media. A small quantity of the sample, about as much as will lie on a knife-point, is mixed with 100 c.c. of distilled water and thoroughly shaken up, care being taken to see that all small lumps are broken; 1 c.c. of the mixture is further diluted to 20 c.c. with water and again shaken. By means of a glass rod or pipette one drop of the diluted mixture is placed in a clean microscopical slide and allowed to evaporate in an atmosphere free from dust. One drop of olive oil is placed on a cleaned cover glass, which is carefully lowered on to the slide, which is then examined under a low power. The coefficient of visibility of diatomaceous silica and olive oil is very low, which results in the diatoms being almost invisible, while inorganic silicates, quartz, sand, silt, clay, etc., become very pronounced. In a preliminary examination of this kind it is quite easy to roughly estimate the amount and nature of the impurities. If a permanent mount of the impurities is required for future reference, the material is mounted in amyl-sandarac. Further investigation of the impurities may be undertaken by examining the material mounted as above, under polarised light. Diatomaceous silica is isotropic, consequently it does interfere with the plane of polarised light, and when examined through crossed Nicols, it takes the colour of the field, while the crystalline and other impurities exhibit a play of colours. In order to examine the diatoms themselves, it is first necessary to clean them. A small quantity, about 1 gm., is placed in a conical flask, together with a few crystals of sodium carbonate and 100 c.c. of water and gently boiled for a few minutes, allowed to cool, successive quantities of water are added until the diatoms are washed free from soda. Then 100 c.c. of nitric acid is added, the mixture again boiled; when boiling, one or two crystals of potassium bichromate are added; the boiling must not be too vigorous or too long. When cool the diatoms are washed free from bichromate and acid by successive changes of water, the last washings to be in distilled water. The diatoms, now cleaned, are kept in about 100 c.c. of chloroform water; and spread slides are prepared in the aforesaid manner. In this case it is essential to mount the clean diatoms in a medium with which a high coefficient of visibility is obtained. Styx dissolved in xylol is most useful for this purpose, and the diatoms are examined under low and high power.

The type, species, nature and state of the frustules should be carefully noted. The types present may be discoid or centric, or may be linear or pennate; both types

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may be equally represented, but in most cases there are one or two dominant forms according to the origin of the deposit. Some deposits consist almost entirely of one species while others may possess as many as thirty. The examination of the species gives a valuable clue to the origin of the deposit; its geographical source and whether of marine or fresh water origin. It is necessary to examine the markings in the valve, also the general state of the frustules, whether whole and well preserved or badly crushed and broken. Fresh water deposits are, in the main, well preserved. They are more strongly siliceous, the valves are often reinforced with stout costae and they are tougher; whereas some of the marine deposits are in a bad state of preservation, the weaker frustules having been crushed by the weight of the superstrata, or ground to powder by glacier movements. (The author gives details of the results of examining ten samples microscopically.)

USE AND APPLICATION

In dealing with the uses of diatomite, only those that have a direct bearing on the subject of this paper will be reviewed. Selecting the uses to be dealt with, as it is almost impossible to draw a line between pharmacy and applied chemistry and the uses in applied chemistry are many. The following uses are considered together with the characters that fit the material for the specific use.

Use	Characters
1. Filtration	
A. In powder form for liquids, such as:	Incoherence, porosity, relatively low apparent density; insolubility. Fine state of subdivision.
Oils and fats.	
Syrups.	
Solutions.	
Tinctures, infusions, etc.	
B. In bonded form.	Porosity and fine state of subdivision.
Serums and vaccines.	
2. Absorption	
Packing corrosive acids.	Porosity; large surface area.
Disinfectant carrier.	
3. Abrasion (mild)	
Tooth - pastes and powders.	Low compression strength.
Nail polishing stone.	Angularity of particles.
4. Toilet	
Face powder.	Porosity.
Bath powder, etc.	

The best type for filtration is a mixture of discoid and pennate forms, but the two forms must be in proper size relation; further, a certain amount of very small particles should be present so that the inter-spaces may vary down to that size particle, which is the largest to be allowed in the filtrate. A superabundance of large diatoms increases the rate of flow, but may give a cloudy filtrate; whereas more than a sufficient quantity of small particles, or a sample containing small diatoms of uniform size and shape, tends to decrease the rate of flow, or may even stop it altogether. (Graphs illustrate this part of the paper.) Diatomite has a wide application in filtration, and on large-scale operations the filter-cloths or plates receive a pre-coat of diatomite. The pre-coat forms a porous barrier and serves to retain even the most finely divided particles, whether of rigid or crystalline nature, or amorphous or colloidal nature. The quantity required is quite small, but varies according to the nature of the impurity in the liquid to be filtered, from 0.25 to 5 per cent. being as a rule sufficient. The material should be pure and calcined, and as free from iron as possible. The grit content should not be above 5 per cent. if non-rigid particles are to be removed from the preparation to be filtered. The co-efficient of absorption also should not be less than 3.0.

Diatomite is particularly useful in the filtration of fixed and volatile oils. It is found that on shaking about 2 per cent. of the powder with a cloudy oil, the amorphous bodies are absorbed or held by the enormous surface area offered and a sustained rate of flow is obtained without the formation of any slime in the filter that in the ordinary way eventually stops the flow

altogether. It was found that diatomite very easily removed water from a sample of cod-liver oil that was contaminated with about 8 per cent. Impurities are more easily removed from the oils if they first coagulate by freezing. This was found particularly useful in the case of liquid paraffin and linseed oil. Petroleum jelly and beeswax were successfully filtered.

It is noticed that when the powder is shaken up with certain pigmented solutions and filtered, the filtrate is colourless. It is suggested by Bigot that this bleaching is due to ozone held within the frustule of the diatom. Very little evidence is put forward to support this view, and repeated tests the author has made have yielded negative results. Further, after submitting a sample to a prolonged calcination at almost white heat, during which all absorbed mixture and gases most certainly must have been driven off, it was found that its decolorising properties were in no way affected. The author is of opinion that the decolorising effect is produced by a mechanical carrying down of the dye particles by the enormous surface area offered by the diatoms. No actual bleaching takes place at all; all the dye particles are held up by the diatomite and are retained by it in the filter. The same result is obtained when animal charcoal, kaolin or talc is used. In filtering coloured solutions it is necessary to ascertain the effect of the diatomite on the colour.

On account of its great porosity it is successfully used as a packing for mineral acids; for this purpose almost any kind will do. As a carrier of disinfectants, such as carbolic acid or cresols, it forms a cheap and efficient base. No interaction takes place between the acids and the carrier. Diatomite impregnated with suitable waste liquors has been used as a fertiliser. It is claimed that it increases the porosity of the soil. The use of diatomite as an abrasive is not extensive, owing to its supposed grittiness. Pure diatomite is not gritty, and if the right type is selected it is quite suitable for dentifrices. For this purpose, only the purest deposit should be used; the material should be a light air separated one and should be of marine origin, thus ensuring diatoms of the lowest compressive strength. In order to be suitable for a dentifrice the diatoms should, when viewed under the microscope, break upon being touched with a badger hair. When mixed with a suitable quantity of plaster of Paris or other binder and made into small blocks, diatomite may be used as a nail-polishing stone. The suggestion that diatomite should be used as a face powder is generally met with scepticism and antagonism, but so far its use has been accompanied by success. For this purpose the material should be the lightest air-separated portion of the purest grade obtainable. Here again it is necessary to use material of marine origin. It is held that diatomite has an advantage over the usual form of starch powder in that when applied to the skin it does not swell when in contact with the natural moisture. Dusting powder may be made by adding suitable antiseptics or deodorants, and its ability to be poured through sifter-top tins may be increased by the addition of talc. (Several illustrations and graphs are appended.)

The author expresses his indebtedness to Mr. T. E. Wallis, to whose helpful and constructive criticism the appearance of this paper is entirely due; also to the Vice-Principal and Mr. Howling of the Imperial Institute, who supplied the New Zealand earth used in the filtration experiments.

DISCUSSION

Mr. DEANE said he agreed with the suggestion to examine microscopically any sample of diatomite for specific purposes. He did not agree, however, that the name should be changed to diatomite, as the present name kieselguhr was quite well known. He had found considerable quantities of calcium carbonate as an impurity in practically every sample he had examined.

Mr. WALLIS congratulated Mr. Hendey on his excellent paper.

Mr. MANN referred to the table of decoloration, and said he could not find the quantities used.

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Mr. EVERS confirmed Mr. Deane's statement that calcium carbonate occurs in the cheaper grades to a considerable extent. He, too, would like to know if there was any real reason for changing the name.

Mr. HENDEY, in reply, said the name kieselguhr had been applied to substances other than diatomaceous silica. The term diatomite conveys to the mind some definite idea of the substance. Calcium carbonate occurs in Norwegian diatomite more than in any other. In the filtration of dyed products some loss of colour is usually observed.

The next paper, summarised by Mr. Self, was:—

A Simple Form of Continuous Extraction Apparatus

By P. A. W. SELF and C. F. CORFIELD

[ABSTRACT]

SINCE it is probable that the next edition of the British Pharmacopœia will prescribe continuous hot extraction with volatile solvents in some of its assay processes of vegetable drugs, it has been thought that a description of a simple, cheap and very efficient form of continuous extraction apparatus, which has been in use for a number of years, might be of general interest. The apparatus may be used for any solvent boiling at a reasonable temperature; in operation it requires very little attention and is durable as well as inexpensive. It is useful for a number of general purposes and for special determinations, such as the extraction of jalap, scammony, araroba, etc., and of cinchona bark, nuxvomica seeds, and other alkaloidal drugs containing fairly stable alkaloids. The construction is shown in the accompanying sketch; Fig. 1. *A* is an outer tube of stout glass; *B* is an inner tube of stout glass similar in shape to a short boiling tube with a hole at its lower end; *D* is a coil of iron or copper wire. The method of setting up the apparatus is as follows:—*A* is fitted by a cork to the distilling flask *E*. A thick pad of cotton wool *G* is then placed in the inner tube, moistened with the solvent to be employed and pressed down firmly. The drug to be extracted, previously moistened with the solvent and subjected to any preliminary treatment required, is introduced supporting *B* so that the

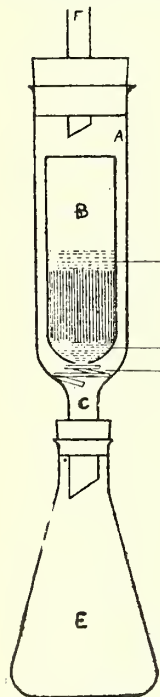


FIG. 1

percolate drops into the outside tube. A second pad of wool *G'* is then placed on the top of the drug, the inner tube is lowered into position and the outer tube connected by means of a suitable cork with the tube of a reflux condenser *F*. When the lower pad of wool is pressed down firmly the distillation of the solvent needs practically no regulation. The only disadvantage of the apparatus is that it is impossible to free the lower pad of wool from air. Air locks may be prevented by stopping the distillation at short intervals during the early stages of extraction. Since this interruption is sometimes found

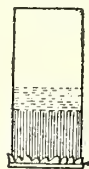


FIG. 2

inconvenient, a second form of inner tube, Fig. 2, is an advantage, and in this no lower pad of wool is required. This form is preferable when rapid extraction is required and when the material to be extracted is somewhat intractable. It consists of a straight glass tube open

at both ends. Over its lower flanged end is tied firmly a piece of calico or other suitable material, and over the drug to be extracted is placed a pad of wool as before. The authors give dimensions suitable for the extraction of from 10 to 20 gm. of a vegetable drug.

DISCUSSION

Mr. MARRIS suggested that in every case the amount of menstruum should be specified.

Mr. BREWIS congratulated the authors, adding that their apparatus was not unlike the old Dunstan apparatus of several years ago. He (the speaker) had adopted a similar idea. The usual form of extraction thimble was disadvantageous.

Mr. SELF, in reply, agreed that the amount of absorbent should be prescribed. Like Mr. Brewis, he had given up the Soxhlet apparatus.

The next paper, also presented by Mr. Self, was:—

Determination of Total Alkaloids in Cinchona Bark

By P. A. W. SELF and C. E. CORFIELD

[ABSTRACT]

IT is common knowledge that the method of the present British Pharmacopœia for the assay of cinchona bark is unsatisfactory in almost every respect. Since the issue of the Pharmacopœia in 1914, a number of new processes for the determination of the total alkaloids of cinchona bark have been published, of which the four following are the more important:—The method of the U.S.P. X; the method of the German Pharmacopœia VI; the method of Auermüller, suggested as an international method; the method of F. J. Todd ("Year-Book," 1927, 455). In order to investigate further the value of ammoniacal alcohol for the preliminary extraction of the bark, a number of experiments were made, using a modification of Todd's method, which is described.

In view of the objections to extraction with ammoniacal alcohol, the authors considered it desirable to adopt some other method of extraction, and experiments have been made using alcohol as the solvent in conjunction with reagents which might be expected to fix the colouring matter of the bark. The principal methods are given in the paper. The details of the method recommended are as follows:—

Mix thoroughly 10 gm. of the bark in about No. 60 powder, with a mixture of 7.5 c.c. of strong solution of lead subacetate and 12.5 c.c. of water and allow to stand for about an hour; add 50 c.c. of ammoniacal alcohol (alcohol 97.5 parts, strong solution of ammonia, 2.5 parts), mix well, allow to stand for a further hour; transfer to a continuous extractor with a little more of the ammoniacal alcohol and extract for from three to four hours. Distil off the greater portion of the alcohol, add 10 c.c. of *N*/1 sulphuric acid and 40 c.c. of water, heat to boiling and cool. Filter into a separator through a tightly packed plug of cotton-wool previously moistened with water, treat the residue in the flask with 15 to 20 c.c. of boiling *N*/10 sulphuric acid, cool and filter, and finally wash the flask and plug of wool with cold acidulated water until a few drops of the filtrate show no opalescence with Mayer's reagent. To the contents of the separator add about 20 c.c. of chloroform and shake vigorously and continuously for about one to two minutes; allow the chloroform to separate and run it into a second separator containing a mixture of 5 c.c. *N*/1 sulphuric acid and 15 c.c. of water; shake well, allow the chloroform to separate and reject. Shake the liquid in the first separator with two further quantities of about 20 c.c. of chloroform, running each into the second separator and washing as before. Transfer the acid washings contained in the second separator to the first separator, make distinctly alkaline with ammonia and extract completely with chloroform. Wash the chloroform solution of the alkaloids with a little water, distil off the chloroform as completely as possible, add about 5 c.c. of alcohol and evaporate to dryness, dry at 100° and weigh.

The results obtained in the various experiments are summarised in two tables. The experiments recorded in the first table were conducted on a sample of red

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bark of average quality (anhydrous quinine, 1.08 per cent.):—

Process used	Time of extraction	Result per cent.
1. Extraction with ammoniacal alcohol	Three hours	6.23
2. Digestion with milk of lime, followed by extraction with ammoniacal alcohol ..	Three hours	6.10
3. Digestion with 5 c.c. of strong lead subacetate solution and 15 c.c. of water, followed by extraction with ammoniacal alcohol	Three hours	6.44
4. Digestion with 5 c.c. of strong lead subacetate solution and 15 c.c. of water, followed by extraction with ammoniacal alcohol	Three hours	6.40
5. Method of the U.S.P. X. ..	—	6.30
6. Method of the U.S.P. X. ..	—	6.39
7. Method of the D.A.B. VI. ..	—	4.76

The second table shows the results of experiments on a sample of red bark of very high alkaloidal content.

CONCLUSIONS

The assay processes of the British Pharmacopœia and the German Pharmacopœia for cinchona bark are so inaccurate that they are for all practical purposes useless. The process of the United States Pharmacopœia may give somewhat low and variable results. Extraction with ammoniacal alcohol presents difficulties on account of the colouring matter obtained and yields slightly low results. Preliminary treatment of the bark with lead subacetate is a great advantage, and the highest results are obtained by using this reagent with subsequent extraction with ammoniacal alcohol. The method recommended yields accurate results, is comparatively easy to carry out, and gives an alkaloidal residue having a high degree of purity.

DISCUSSION

Mr. MARRIS pointed out the difficulty in practice of extracting all the alkaloid present in a cinchona bark, and instanced a case in which 8.8 per cent. was found by analysis but the works could only obtain 6 per cent.

Mr. BULL was chiefly interested in the paper for its bearing on the suggestion that a standardised extract of cinchona should be introduced into the next Pharmacopœia. The present B.P. method was very inefficient. Did the authors think it desirable to attempt to estimate the whole of the alkaloid present?

Mr. D. LLOYD HOWARD agreed with the authors that volumetric methods were unsatisfactory in cinchona analysis. The suggestion of adding strong lead subacetate solution before proceeding to extract was a novel one. It followed from the facts of the paper that it was better to start alkaline than to start acid. Obtaining results so near the possible showed the accuracy of the authors' work.

Mr. FERREY remarked that chloroform extracts a certain amount of resinous matter which counts as quinine, but ether does not.

Mr. EVERS agreed with the authors that cinchona analysis has been a source of endless trouble. Was room a sufficiently high temperature for drying? He would prefer 110°.

Mr. BULL made a further suggestion—that under ordinary conditions of extraction alcohol was to be preferred to ammoniated alcohol.

Mr. SELF, replying, agreed that extraction in manufacturing must be a difficult matter. He thought that the analyst must determine the amount of alkaloid actually present. It was absolutely incorrect to suggest that alcohol was a satisfactory solvent: the authors had tried it. (Mr. Self gave details.) Ether was very suitable for quinine but not for other cinchona alkaloids. If one attempted to dry a chloroformic solution, it was not easy to get a constant weight; if a little alcohol was added to the solution, there was no difficulty. Sometimes one had to choose the lesser of two evils.

The next paper, presented by Dr. A. D. MacDonald, was:—

The Assay of Digitalis by the Cat Method

By A. D. MACDONALD and WALTER SCHLAPP

[ABSTRACT]

THE cat method of assaying digitalis preparations, originally introduced by Hatcher and Brody, has been adopted as standard by a number of pharmacopœias. The experience gained in its use by various workers, especially by de Lind van Wijngaarden, has resulted in the establishment of a formula by which the number of separate determinations required for an assay of any given degree of accuracy may be ascertained.

It seemed to the authors that the use of ether as an anæsthetic might be a factor contributing to irregularity, and that an improvement in the figures might be obtained by abandoning the practice of assaying one poisonous substance upon an animal already under the influence of another. Further, the action of digitalis on the mammalian heart is a complex one, the direct action on the heart being accompanied by the action on the medulla. Without going into the question of the relative importance of these two actions, it is probably better for purposes of assay to eliminate one of them, which is easily accomplished by using a spinal preparation. The authors have, therefore, carried out a number of assays upon spinal cats from which the ether has been ventilated, and the results encourage the belief that this modification of the cat method increases its accuracy considerably. After a description of the technique of decerebration, the following table of results is given:—

ASSAYS ON SPINAL CATS (Four tinctures)

Experiment No.	I		II		III		IV	
	Lethal dose, 5% tincture c.c. per kgm.	Percentage of average	Lethal dose, 5% tincture c.c. per kgm.	Percentage of average	Lethal dose, 5% tincture c.c. per kgm.	Percentage of average	Lethal dose, 5% tincture c.c. per kgm.	Percentage of average
1	18.4	90	26.1	99	25.0	95	24.2	101
2	19.5	96	27.1	102	27.9	106	22.9	95
3	20.3	100	28.6	108	28.7	109	24.0	100
4	20.3	100	26.2	99	25.3	96	23.4	97
5	22.8	112	24.5	92	24.7	94	25.7	107
6	21.3	104	26.6	100	26.5	100	—	—
Average ..	20.4		26.5		26.4		24.0	
Standard deviation of average: expressed as percentage of average	2.7 per cent.		1.9 per cent.		2.3 per cent.		1.7 per cent.	
Greatest deviation in series	12 per cent.		8 per cent.		9 per cent.		7 per cent.	

(For purposes of comparison, a similar table prepared from results of assays made on cats anæsthetised with ether, is given, followed by a graph.)

It is clear that, using spinal preparations, fewer animals are needed to give results of any required order of accuracy, and a widely discrepant observation is unlikely. Taking an assay on five etherised animals, a discrepancy of the order of 36 per cent. in a single observation, were it to be on the other side of the average, would modify the final figure by as much as 14 per cent. Such a difference might prove serious clinically when the massive dosage of the tincture is used. With the assays quoted from the new method, the corresponding figures do not exceed 4 per cent. While it may be argued against this method that more skill is required in the preparation of the test animal and more time is required for an assay, it is believed that when its possibilities have been explored it will establish its value.

These investigations were carried out in the Department of Pharmacology, University of Manchester.

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DISCUSSION

Mr. NUTTER SMITH wondered if the excessive strength and high toxicity found in some American tablets would be accounted for by the use of the cat method of assay.

Dr. HAMPSHIRE congratulated the authors on an excellent piece of work.

Mr. BOYES said the cat method had been subjected to a good deal of criticism. Some workers prefer the frog method.

Dr. MACDONALD, in reply, said he did not think the first question raised would arise in this country. The tinctures they had purchased varied not more than about 10 per cent., and showed little difference in their toxicities.

The next paper taken was:—

Notes on the Chemical Assay of Mercurochrome "220"

By G. W. MARRIS

[ABSTRACT]

THIS brief report is based upon a series of tests arising out of the everyday control of manufacture. Its object is to show what measure of consistency one may expect from published methods which do not require more time than can conveniently be spared for them in the usual routine of the laboratory. It would be erroneous to assume that the mere analytical control of the inorganic content of "220" is, in itself, a guarantee against undue toxicity. It is easier to make a good sample than to recognise it as such afterwards.

Assay of Mercury Content.—0.2 gm. of mercurochrome is dissolved in 10 c.c. of sulphuric acid by moderate heat; 1.5 gm. of potassium permanganate is used to oxidise this quantity and the excess of permanganate is removed with powdered oxalic acid after suitable dilution with water. The original method employs an 800 c.c. Pyrex Kjeldahl flask for the oxidation. I have used 500 c.c. flasks quite successfully. The necks of these flasks are rather wide, and, as the quantity of liquid available is limited, it requires patience to wash down all adherent particles into the body of the flask when starting the test. I usually suspend a tube, 1.5 cm. wide and 15 cm. long, centrally in the neck of the flask by means of a piece of card having a hole in the centre. By weighing the sample upon a piece of highly-glazed paper the majority can be made to fall directly to the bottom of the flask, and the few particles which adhere to the tube can be removed completely by the current of acid delivered by a 10 c.c. pipette. It is usual to employ the permanganate in fine powder for this purpose, but, in my hands, a fairly rough powder produces less flashing as it does not cake together so readily. The chief danger of a too vigorous reaction is when the brown oxide is just beginning to show. Extra care is also necessary in the dilution of the acid magma. It is best to pour as much as will run readily from the Kjeldahl flask in a thin steady stream into a beaker containing 150 c.c. of water. After gentle agitation the diluted mixture can be poured back without any undue local heating. After the careful addition of powdered oxalic acid the liquid is perfectly colourless and free from any chemical precipitate. If the assay be completed gravimetrically a disc of filter paper under the asbestos in the Gooch crucible greatly expedites matters. The mercury content should be closely 23.5 per cent.

Assay of Bromine Content.—In the control of manufacture, when work can be planned out beforehand, the Carius method is the most convenient. In consequence of two explosions I have found it necessary to relieve the pressure after about three hours at 160° C. when working with mercurochrome. For routine purposes I prefer the peroxide method by which, with rapid filtering arrangements, bromine can be estimated in just over an hour. For the oxidation I use an ordinary steel crucible with a lid which fits reasonably well, and has its flange on the outside of the crucible. This

is 4.5 cm. diameter at the top and has an inside depth of 3 cm.: i.e., a capacity of about 40 c.c.. The lid has a countersunk hole bored in a position midway between the edge and the knob so as to admit easily a portion (25 mm. long) cut from the head end of a wire nail 2.5 mm. thick. The underside of the head of the nail has been filed until it fits snugly into the counter sunk hole and hangs securely therein. This is employed as follows.—Prepare a sample of the mercurochrome by powdering and sifting through 80 mesh silk. Into the dry crucible place 6 gm. sodium peroxide (which must be in good condition), make a shallow depression in the surface of this and weigh in 0.3 gm. mercurochrome and 0.2 gm. sugar. Sugar in small distinct granules gives the best control of the ignition. Powdered sugar is liable to burn with violence. Mix lightly but thoroughly with a thin glass rod, being careful to prevent any of the powder creeping higher up the side than is necessary. Then, by means of a bright spatula, draw away the powder from contact with the crucible to a depth of 5 mm. so as to form a trough round the periphery. Weigh a further 3 gm. sodium peroxide. This quantity is then spread over the whole surface of the mix so as to fill up the trough and bring all level. Place the lid in position (minus the wire nail) and set the crucible in a deep-shaped basin, 10 cm. in diameter and about 4.25 cm. deep. Pour sufficient cold distilled water into the basin to immerse the crucible to within about 2 mm. of the bottom of the flange of the lid. Select a plain glass funnel (with an oblique end to its spout) of such a size that when inverted over the crucible in the basin its lip is well covered by the water. Place a short wet test tube over the end of the spout. Then, holding the funnel in readiness, heat the wire nail cherry red and drop it into the hole in the crucible lid. The ignition is sufficiently delayed to enable one to place the funnel in position with some degree of deliberation. After the crucible has finished vibrating it is well to pause for a minute or so because the melt will often crack on cooling and tends to fly a little. If the lid be removed too soon some may be lost. Lift up the inverted funnel and remove the crucible lid, putting it into a beaker to await rinsing, then replace the funnel and pour water into the dish so that it eventually floods over into the crucible. The object is to complete the oxidation in the crucible itself as far as possible, and no more water should be added than will suffice to fill it with the effervescing liquid. The inverted funnel conserves any spray. When the violence of the reaction dies down, remove the funnel, and turn the crucible on its side so as to be sure that there is no agglomeration at the bottom. Then transfer the alkaline liquid, with the necessary rinsings (amounting in all to about 250 c.c.), to a conical beaker and boil well. It is convenient to have a stock of nitric acid of about 35 per cent. strength, which has been balanced against the sodium peroxide. Add, gradually, sufficient of this acid to neutralise five-sixths of the alkalinity and filter. The bright filtrate will often show a very faint fluorescence. Add about 15 c.c. sulphurous acid and mix well, and then the remaining one-sixth of the nitric acid. Gradually bring to the boil, and continue the heating until the sulphur dioxide is dissipated. A small further addition of diluted nitric acid may be necessary. Then cool and proceed as preferred. A series of six estimations on a single homogeneous sifted sample gave, by this method, from 18.7 to 18.9 per cent. of bromine working under ordinary laboratory conditions. The Carius method returned 18.6 per cent. in three estimations. A series of commercial samples, old and new, gave a range of 18 per cent. to 21.3 per cent. of bromine. The ideal is closely 18.8 per cent.

Assay of Acetic Acid.—The complete separation of sodium acetate from dibromo-hydroxy-mercury-fluorescein has presented rather a problem to manufacturers, and no assay of mercurochrome is complete without an investigation of the proportion of acetic acid present. The method given by White works well: 0.5 gm. mercurochrome, 15 c.c. syrupy phosphoric acid with 100 c.c. of water is steam distilled in a 300 c.c. Claisen flask

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tilted for greater safety against spray. The steam supply tube passes down the longer neck, the other being closed by a rubber stopper. As is usual with estimations of this kind, a great deal depends upon the vigour of the steam supply, and it is well to run a control with sodium acetate to test out the arrangement of the apparatus. For instance, I found that the use of a copper flask for the production of steam took the test practically to finality with 100 c.c. less distillate than when a glass flask was used. Commercial samples yield from 1 per cent. to 3 per cent. of acetic acid. Probably the limit will eventually be fixed at one per cent.

The Sodium Content.—A point not readily dealt with by ordinary methods is that of the *Pri* figure of solutions of "220," and one feels that, in the past, supplies which have proved unsatisfactory in use may possibly have been alkaline. This point is now being investigated, and the effect of variation upon the clinical action is also receiving attention.

Assay of Moisture.—Normal mercurochrome loses about 10 per cent. of its weight when dried at 110° C. at 15 mm. pressure.

DISCUSSION

Mr. R. R. BENNETT, after thanking the author, remarked that the mere analytical control of mercurochrome was not sufficient. A factor of considerable importance, when intravenous use was intended, was the presence of free mercury, samples of mercurochrome containing up to 3 per cent. being not uncommon. Every batch should have a certificate of biological assay.

Mr. MARRIS, in reply, said it was simply incredible how much mercury was present in some of the older samples of mercurochrome. It was necessary, with unknown samples, to filter carefully and use soon after in the case of intravenous injection.

The last paper presented at the morning session was:—

Systematic Qualitative Analysis of Vegetable Extractives

By ALAN H. WARE

[ABSTRACT]

WHEN carrying out a systematic analysis of plant extractives with a view to their identification, it is generally desirable to commence with an examination for plant phenols: for, of all easily extracted substances, these are the most widely distributed and possess the most specific and distinctive characters. The author has found it possible to devise a scheme whereby some half-dozen tests, involving the use of about the same number of reagents, will enable the investigator to distinguish readily between some twenty-five classes of extractives in a very much shorter period of time than hitherto has been thought possible. The reagents used are ferric chloride, nitrous acid, ammonia, formaldehyde and Mitchell's reagent (ferrous sulphate and Rochelle salt), with an appropriate acid as subsidiary agent when required. The scheme to be described involves the successive application, to fresh portions of the extractive or solution, of the following tests, in an order dependent upon the indications given by the preliminary tests.

(I) Preliminary tests on filter paper:—(1) In which ferric chloride and ammonia are used; (2) in which sodium nitrite, acetic acid and ammonia are used.

(II) If the results given to the tests under (I) indicate the possibility of emodin bodies being present, these are tested for as usual by shaking out the extractive with petroleum ether and then the latter with aqueous ammonia. Special tests for individual substances to be described are then applied.

(III) Next, if the indications point that way, the author's specific test for phlobatannins is applied. In this the extractive is boiled with formaldehyde in *N/5* aqueous HCl.

(IV) Lastly, as far as the preliminary examination to be described in the present paper is concerned, the author's "omnibus" test with Mitchell's reagent and Rochelle salt is applied.

The filter-paper methods are new and yield a number of new or improved results. Amongst the results obtained, and not before recorded, is a particularly useful and distinctive colour reaction for aloes of the Socotrine or Zanzibar class.

If necessary, commercial extractives must be diluted with water or alcohol, or a suitable mixture of each, to give a clear solution which will produce a definite but not too marked stain on filter paper when placed upon it for the purpose of the test. Unless the substance is obviously a resin or a volatile oil, an aqueous extractive is first prepared and tested; subsequently, if necessary, 45 per cent. or 90 per cent. alcohol (or industrial methylated spirit) are tried. Dried drugs are generally most conveniently used in about Nos. 15-20 powder. Usually alcoholic extractives can be sufficiently satisfactorily made for testing purposes by digesting on a water bath for a short period, and aqueous extractives by decocting for a few minutes. It is usually wise to prepare a small quantity of a relatively strong extractive and then dilute if necessary. It is rarely necessary to adopt any elaborate method of extraction unless the substance is scarce or costly.

It has been found advantageous to carry out these tests in two pairs, each pair on separate filter papers; actually, in each case, the author uses two superimposed papers placed upon a white tile. In each case, also, sufficient extractive is placed upon the superimposed papers to cover an area, after spreading, of about $2\frac{1}{2} \times 1\frac{1}{2}$ inches. Following the principal reagent, in each case ammonia is used in such a way that it will frequently give a result of its own and also modify the result obtained with the ferric chloride or the nitrous acid, as the case may be.

(1) *Tests with Ferric Chloride and Ammonia.*—The moist area above referred to is envisaged as being composed of two halves. Into the middle of one-half, by means of a fine pipette, is dropped one to two drops of aqueous ferric chloride solution (1 per cent.), and the result is duly noted. Next, very small drops of aqueous ammonia (10 per cent.) are added, drop by drop, commencing on the outside part of the moist area furthest away from the iron spot, but gradually approximating more closely to the portion of field affected by the iron, until, if necessary, visible overlapping occurs. After each addition of ammonia a moment or two is allowed for it to spread and immediately any colour change indicates that the ammonia has diffused into the iron area no more is added. It will not be found necessary to add many drops. The specific effect of the ammonia itself is noted, and also any change which it induces in the colour-reaction given by the iron. Discussion of the results obtained will be postponed until after the other pair of tests above referred to has been described.

(2) *Tests with Sodium Nitrite, Acetic Acid and Ammonia.*—Upon the second pair of filter papers moistened with the extractive or solution, with the aid of the glass rod, spread sufficient saturated solution of sodium nitrite to cover the moistened area. Note any colour production or intensification given at this stage. Then add acetic acid in the manner directed for the ferric chloride in the first pair of tests. Allow a few moments for the acid to spread and react. If no change or intensification of tint is observed, warm gently until a slight change of the kind indicated is produced. Then add ammonia in the manner described under (1), care being taken to allow the ammonia to spread between each addition and to use very few drops in all. No further addition of ammonia is made when it is evident that definite overlapping of the nitrous acid field has occurred. Separate records are made of any colour reaction given by the ammonia alone with the extractive and that given by the combined effect of the nitrous acid and ammonia. In the last case, if

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no very distinctive reaction is given in the cold, the paper should be warmed, very gently at first.

Distinctive reactions with aloes containing iso-barbaloin will be given to the method described above, but the following modification gives a specific reaction with all aloes of the official types, including the Socotrine or Zanzibar type (which does not give any response of value to the above method, unmodified, or to any other test with oxidising agents in the author's hands).

Powder a fragment of the aloes or suspected aloes to be tested and rub out with a few c.c. of saturated solution of sodium nitrite. Filter into a test tube. Next add 1 to 2 drops of 30-per-cent. aqueous acetic acid and shake for a minute. If a pink to carmine-purple colour is given, the substance is most likely to be Curaçao or Cape aloes. If little or no colour change or intensification is given, warm gently until a definite result is observed. Sufficient solution of ammonia is then added to produce a further change or intensification of colour and to give a distinct smell of ammonia. Now pour a little of this mixture upon superimposed filter papers as described in the other tests. Lastly, add, drop by drop, 1 to 3 drops of a 30-per-cent. aqueous acetic acid, each drop to a different portion of the moistened area. Allow sufficient time for the acid to spread and react, and then warm, if necessary, gently at first. If the substance be an aloes a display of colours is given in which purple is usually most in evidence.

RESULTS AND DISCUSSION

The results, given to the tests already described fall under three main heads, viz.:—

(A) *Results given to Iron.*—Most plant-phenols form iron compounds possessing considerable tinctorial power, which may change their colour with varying hydrogen-ion concentration, but remain capable of giving useful results through a considerable range of such variation. The slow diffusion of the iron salt and the ammonia, successively, on the filter paper, result in the setting up of such differing degrees of hydrogen-ion concentration in various parts of the field of reaction that, somewhere or other, the most specific reaction is bound to be given with much smaller proportions of the phenol concerned than will usually give a satisfactory result to a test-tube method. Generally, instead of a single colour, two or more colours are to be seen, either successively or together; in the latter case, of course, in different areas of the field. Classifications can frequently be satisfactorily made by this method, by what is practically one operation, which would take several distinct tests if test-tube methods are employed; especially if one includes the results given to the ammonia alone, as well as its modifying effect upon the iron reaction. The actual colour reactions which may be obtained are described in tables; but especial attention is called to the very superior results which this method gives with phenolic resins, essential oils containing phenols, extractives in which tannins, by dehydration or oxidation, have been converted into water-insoluble phlobaphenes; extractives containing only very small quantities of catechol-type phenols, such as ipecacuanha and, in particular, nux vomica preparations; and preparations in which the reactions of one phenol may mask those of another, e.g., the reactions due to pyrogallol-tannin are well seen with rhubarb or koussou on the filter-paper but not in the test-tube, and hamamelis leaves and rose petals each give indications of the presence of more than one plant-phenol to the method under discussion, the results in the test-tube being much more dubious.

(B) *Results given to Nitrous Acid.*—In the first place it may be noted that, if a negative reaction is given to this test on filter-paper, phenols are certainly absent, and that if a positive result is yielded phenols are almost certain to be present. For this purpose the production merely of a pale yellow colour is to be regarded as a negative reaction. The most important results yielded to this test, however, are those given by ellagitannin extractives and by certain aloes. It should be noted that extractives of each of these may be

sufficiently acid to liberate nitrous acid on the addition of the sodium nitrite, with the result that specific colour-reactions are given before the addition of the acetic acid. This is very notably the case with myrobolans, which gives unusually specific reactions partly dependent upon this fact. It is interesting to note that ellagitannin and iso-barbaloin give closely similar results, although they are by no means closely related phenols. These results differ from those given by any other phenols known to the writer. The new results obtained with aloes of Socotrine or Zanzibar type are also particularly interesting.

With aloes containing iso-barbaloin the best results are obtained by the ordinary method, but with aloes of the Socotrine or Zanzibar type the results are of a different character, and the conditions required to bring about the production of the colours described are not always obtained by the first method, but appear to be given with certainty to the second method. Sometimes a very fine display of three or four colours is given to each of the methods.

(C) *Results given to Ammonia or to Sodium Nitrite (behaving as a buffer salt).*—On the addition of sodium nitrate the colour of extractives containing pyran bodies (e.g.—hæmatoxylin, brazilin and some of the anthocyanins) may be changed or intensified. This is due to the buffer salt effecting a reduction of hydrogen-ion concentration and not due to the liberation of nitrous acid as in the case of its behaviour with myrobolans, etc. With many other phenols colour reactions are given if a drop or two of solution of ammonia are added in the manner directed. In many of these cases the results given by ammonia in the presence of buffer salts such as sodium nitrite are different from, or better than, those given by ammonia alone. In a still larger number of cases results are yielded which are unobtainable in a test tube. This is notably the case with extractives containing gallic acid and gallic acid tannins, which give quite frequently a green colour often preceded by a pink. The pink colour is often better given by the ammonia alone, but the green colour is generally better given in the presence of the sodium nitrite, when, in some cases, it may be modified in places into a definite blue.

(A table divided into fifteen sections is given in the paper.)

SYSTEMATIC EXAMINATION

The preliminary tests on filter-paper afford the first criteria for a systematic investigation, for the results obtained enable us at once to place extractives into three large primary groups which give us convenient starting points for a further examination; there are:—

Group I.—Extractives which give with ferric chloride, both before and after diffusion of ammonia into the iron area, one or more of the following colours, viz.: green, blue, violet or purple. Colours are given to the ammonia and nitrous acid tests which may be either merely shades of brown or more specifically distinctive.

Group II.—The colour, or occasionally two colours, given by these extractives to ferric chloride before the addition of ammonia vary, but are most frequently green or brown. After diffusion of ammonia the colour changes to a brown or purple-brown. Occasionally the change is merely due to destruction by the alkali of the iron compound first formed. Positive results are given to the ammonia and nitrous acid tests which vary with respect to colour, but very frequently ammonia gives a yellow which does not change or fade quickly.

Group III.—Negative results, or merely a yellow colour, or faint or transient tints only of other kinds, are given to both sets of tests. In this case phenols are either entirely absent or present only in negligible amounts. It must be noted, however, that some phenols are practically insoluble in water, but that most of these are soluble in alcohol sufficiently to give good results. *Embelia robusta*, for example, gives negative results in aqueous solution, but markedly positive in alcoholic. *E. ribes* has not been tested, but the statement that *embelia* contains tannin appears to be erroneous with respect to *E. robusta*.

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DISCUSSION

Mr. WALLIS said the idea of carrying out tests on filter-papers was a good one.

Mr. A. J. JONES complimented the author on an elaborate piece of work, and hoped he would carry it further.

Mr. BOYES said, with regard to methods of testing on filter-papers, he wondered if some exact definition of Ph strengths would be desirable.

Mr. WARE, in reply, said he was concerned principally with practical results.

The CHAIRMAN, in adjourning the proceedings, thanked the authors of the papers.

Science Section

Wednesday Afternoon

The fact that only four papers remained on the list for presentation probably accounted for a slight reduction in the number of members present, compared with the morning session, on the resumption, shortly after two o'clock, Mr. Humphrey in the chair. The first paper taken was:—

The Rapid Iodimetric Determination of Iron in Scale and Other Pharmaceutical Salts

By G. J. W. FERREY

[ABSTRACT]

The iodimetric method prescribed by the U.S.P.X. is criticised on the grounds of inconvenience and large experimental error. It is shown that, in the presence of six molecules of potassium iodide per atom of ferric iron, reduction to ferrous iron occurs very rapidly if the concentration of hydrochloric acid is great enough. The required concentration of acid depends on the radicle associated with the ferric ions. Dilution with water before titration with thiosulphate leads to reversal of the reaction $\text{FeCl}_3 + \text{HI} \rightleftharpoons \text{FeCl}_2 + \text{HCl} + \text{I}$, but if the thiosulphate is added without previous dilution, no reversal takes place, and the thiosulphate required is an accurate measure of the ferric iron. Iodine may be titrated in the presence of 3N.HCl with accuracy. Conditions under which ferric iron in several pharmaceutical salts may be determined rapidly are worked out on the basis of these facts.

From the experiments recorded, the proportions of reagents given below were indicated:—

Compound	Fe per cent.	Quantity	Water c.c.	Hydrochloric acid B.P. c.c.	Potass. Iodide gm.	Reference to notes
Ferric chloride B.P.C.	20.66	0.5 gm.	18	2	2	—
Liq. ferri perchl. fort.	20	0.5 c.c.	18	2	2	a
Liq. ferri perchl. fort., B.P.	5	5.0 c.c.	30	4	4	b
Tr. ferri perchlor. B.P.	5	5.0 c.c.	30	4	4	c
Liq. ferri dialysatus, B.P.C.	3.5	5.0 c.c.	20	3	3	d
Liq. ferri persulph. B.P.	14.55	1.0 c.c.	25	7	3.5	e
Ferric alum	11.58	1.0 gm.	20	5	3	—
Ferri et ammon. citrate	21.7	0.5 gm.	16	4	2	f
Ferri et pot. tartrate	21	0.5 gm.	16	4	2	f
Ferric citrate	16	1.0 gm.	20	5	3	f
Ferric phosphate	25	0.5 gm.	14	6	3	—
Ferric phosphate, soluble	12	1.0 gm.	14	6	3	f
Ferri glycerophosphate	14	1.0 gm.	20	9	3	f
Ferri pyrophos. soluble	10	1.0 gm.	14	6	3	f

Notes on Individual Assays.—(a) 5 c.c. liquor ferri perchlor. fort. were diluted to 100 c.c. and 10 c.c. of the dilute solution taken for each test. Eight c.c.

water and 2 c.c. hydrochloric acid were then added. (b) With liq. ferri perchlor. and tr. ferri perchlor., it is more convenient to take 5 c.c. of the undiluted liquid and use double quantities of reagents. (c) The U.S.P.X. process for the assay of tr. ferri perchlor. involves two evaporations to dryness and treatment with hydrogen peroxide, this being designed to oxidise a small trace of ferrous chloride, which forms on exposing the tincture to light. It is simpler, and accurate, to add 5 c.c. of solution of hydrogen peroxide (10 vol.) to the reaction mixture before adding the potassium iodide, and then boil for a few minutes until the excess of hydrogen peroxide and the alcohol are removed, making up to the original volume by the addition of water. The liquid is then cooled under the tap, the potassium iodide added and allowed to dissolve, and the titration carried out immediately.

(d) With liq. ferri dialysatus B.P.C. it is necessary to raise the acid solution to the boiling-point and cool before adding the potassium iodide.

(e) With liq. ferri persulph. B.P. 5 c.c. were diluted to 100 c.c.; 20 c.c. of the diluted liquor taken and 5 c.c. of water added.

(f) In dealing with scale preparations it is necessary to convert the iron into the ionic condition. Simple addition of dilute hydrochloric acid will not do this, but if the acid solution is raised to the boiling-point and boiled for about fifteen seconds, this object is accomplished. The hot solution is then cooled under the tap, the potassium iodide added, and the titration carried out after it has dissolved. This procedure gives accurate results, and it therefore follows that the main purpose served by heating to 40° C. for thirty minutes, as in the U.S.P. method, is to convert the iron present into the ionic condition.

In some samples of iron and ammonium citrate small quantities of ferrous iron are present. If the hydrogen peroxide treatment (as given for tr. ferri perchlor.) is included in the assay of such a sample, a somewhat higher iron content is indicated, due to the conversion of the ferrous iron into the ferric state. For this reason it is desirable, when low results are obtained, and where the total iron content is required, to repeat the assay, including the hydrogen peroxide treatment. In all methods of applying the iodimetric process to the determination of ferric iron, it is good practice to raise the diluted reaction mixture, when the end-point has been reached, to a temperature of about 50° C. If the reduction of iron is complete no blue colour appears on cooling to room temperature, but occasionally one finds that one or two drops of N/10 thiosulphate are required to complete the titration. Only in rare instances in using the method detailed in this paper has it been found necessary to add a little more thiosulphate on carrying out this test. With simple chloride solutions traces of unreduced iron at the end of the titration have not been met with, and in no case examined by this method has more than 0.3 per cent. of the iron remained unreduced on completion of the titration. The method therefore gives results of considerably higher accuracy than those in which the potassium iodide is heated, or stands for prolonged periods at room temperature, in presence of hydrochloric acid. It is perhaps unnecessary to add that if the potassium iodide used contains a trace of iodate a blank experiment should be carried out, but this may, of course, be done for each batch of iodide as received. The hydrochloric acid should also be chlorine-free. Starch may be used as indicator even in 3N.HCl solutions, although no indicator is necessary in the majority of cases. Since the blue colour fades comparatively slowly in strongly acid solutions, it is necessary to guard against overstepping. The addition of one drop of N/10 iodine to the colourless liquid should restore a strong blue colour.

GENERAL METHOD

The iron solution is prepared in accordance with the quantities given above. A 250-c.c. Erlenmeyer flask is convenient to use. In the case of inorganic salts the

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potassium iodide is then added, allowed to dissolve, and $N/10$ thiosulphate may then be run in immediately. In the case of organic salts and scale preparations, where the iron exists in an un-ionised form, the acid solution is raised to the boiling-point, boiled for 15 seconds, and cooled to room temperature under the tap. The assay is then continued, as above. The system must not be diluted with water before adding the thiosulphate. Towards the end-point the addition of thiosulphate should be very slow, in order to avoid over-stepping. It is preferable to avoid local excess of thiosulphate during the titration by rotating the liquid in the flask.

DISCUSSION

Mr. A. J. JONES said he was in practical agreement with the author. He suggested a 50-per-cent. addition of hydrochloric acid. He did not quite like the oxidation with hydrogen peroxide, and preferred the use of potassium permanganate.

Mr. FORSTER raised the question of a difference of iron content, as reported by different analysts, in a sample containing liquor ferri perchloridi.

Mr. EVERS said he had used a method similar to the author's.

Mr. CORFIELD congratulated the author on the way he appeared to have expressed points of detail, and so far as the method of determination was concerned, he agreed with the iodine method.

Mr. FERREY, in reply, said he had experimented with a larger concentration of hydrochloric acid, but with disadvantage. The use of hydrogen peroxide was quite accurate, and better than potassium permanganate, in its results.

The next paper, presented by Mr. A. J. Jones, was:—

Iron and Ammonium Citrate B.P.

By A. J. JONES AND NORMAN GLASS

[ABSTRACT]

THE B.P. prescribes definite quantities of the different components for the preparation of iron and ammonium citrate, but the amount of ammonia that ought to remain present in the final product is not stated. Enough is provided however to allow for 8 per cent. of ammonia being present in the scales, and we find that this figure can be closely approached in practice if the B.P. directions are faithfully carried out. Taking the B.P. figures as a basis of calculation, and adopting the standard of 31 per cent. of iron oxide, the composition of the scales may be expressed in the following terms:—

Fe	...	...	...	...	...	21.70 per cent.
$H_3C_6H_5O_7 \cdot 1Aq.$	...	...	...	...	...	59.70 per cent.
NH_3	...	...	...	...	...	8 per cent.

and these relationships lead to the hypothetical formula—
 $4 Fe (OH)_2 \cdot 5 NH_3 \cdot (C_6H_5O_7)_3$

No claim is made that this formula represents the actual constitution, but it reflects the composition of the B.P. salt.

BEHAVIOUR WITH MAGNESIUM SULPHATE

Commercial specimens of iron and ammonium citrate vary in behaviour of their aqueous solutions when mixed with magnesium sulphate.

"Observations lead us to the conclusion that really satisfactory preparations are independent of either citric acid, ammonia or iron ratios, provided variations are not unreasonable; but such ratios may be of distinct importance in the case of overcoming a fault of manufacture. Two outstanding examples illustrating this point of view are samples 5 and 7 in Table I; both samples gave perfect mixtures with magnesium sulphate, both are acid and of equal ammonia content. They were re-dissolved, treated with ammonia and re-scaled. The reproduced scales were neutral and the two samples were again approximately equal to one another in ammonia content, which had risen by about $2\frac{1}{2}$ per cent. Sample 5 was still perfect in behaviour but sample 7 now gave an immediate precipitate

when tested with magnesium sulphate. The root of this trouble is to be found in the iron hydroxide used for the preparation. With the right type of hydroxide there is no difficulty, but with a faulty precipitate the fault passes on to the final scales. It must be borne in mind that the improper use of heat, either in degree or stage of application, may spoil a preparation which would otherwise be quite satisfactory, although when the right type of hydroxide is used the margin of safety in this respect is very much greater. Experienced manufacturers will, however, be aware of this. Although we ascribe the origin of the precipitation trouble to the iron hydroxide, we are unable to say what the internal mechanism of the mixture is that causes the precipitate to appear after adding magnesium sulphate. It has been suggested that the occurrence of ferrous and ferric ions may have some influence, but our own evidence contradicts this theory."

IRON HYDROXIDE

A useful guide to the quality of a hydroxide is its behaviour on boiling with solution of ammonium citrate: a satisfactory hydroxide dissolves completely to a dark brilliant solution while an unsatisfactory hydroxide may be partially insoluble, or, if soluble, give a solution which is strongly opalescent by reflected light. The colour of the hydroxide is not always a criterion of its quality.

Commercial Samples

The ten samples reported upon were obtained through ordinary trade channels from known manufacturers, and the report has been drawn up to show the composition of the scales as they actually occur on the market. The figures have also been calculated proportionately to a base of 31 per cent. Fe_2O_3 (the B.P. minimum standard) which is equivalent to 21.7 parts of Fe, so as to exhibit the relationship of the three components more clearly. Not one of the samples shows the full 31 per cent. of iron oxide; three stand at 30 per cent. and just over, and seven are below 30 per cent. It must be remembered that the figures are for the scales as received and not for the moisture-free body; but one may safely say that several of the samples would never come up to the B.P. standard even after exsiccation. With citric acid it is quite a different matter: the calculated quantity from the B.P. figures represents 59.7 per cent. of crystallised acid, and not one sample is deficient. There is only one conclusion to be drawn from this, namely, that ten honest attempts have been made to produce the B.P. article, but only four have met with success. Referring to the formula calculation at the beginning of this paper, one might reasonably allow that the proportion of 21.7 parts Fe to 56.5 parts of citric radicle ($C_6H_5O_7$) would meet the case of the B.P. standard for minimum iron and maximum citric acid. In Table II four samples agree with this proposition, while the remaining six have excess of citrate; sample 10 having 68.24 parts of citrate instead of 56.5 parts.

Manufacturers would resort to excess of citric acid only with the object of effecting better solution of the iron, but in the knowledge that the iron content of the scales would be proportionately reduced; while with a perfect hydroxide there would be no need for such expedient. As opposed to this, if a defective iron hydroxide has been employed, and official proportions adhered to, then the reaction does not go to completion; the insoluble oxide is filtered off and there is excess of citrate in the final product. The abnormalities in the analytical figures for some of the commercial samples are interpreted as evidence of undoubted difficulties connected with the iron hydroxide. The reason for the variation in the ammonia content is not apparent. In three examples the makers have evidently worked to complete saturation with ammonia; but other makers leave the preparation with an acid reaction, three having allowed considerable excess. The B.P. directions are to maintain a slight excess of ammonia during the concentration of the liquor, and if this be done the final product is practically neutral to litmus paper. It is clear that this direction has not been followed in several cases because, after treating four of the acid

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samples with ammonia and re-scaling, these samples all absorbed ammonia and the new scales in each case gave the normal PH for the true B.P. preparation, namely about PH 7.5. This can be followed by reference to the tables. In only one sample was acidity found to achieve any practical result, and this has been referred to earlier in the paper in conjunction with sample 5. Samples 8 and 9 were acid in reaction and gave deposits with magnesium sulphate; the addition of ammonia and re-scaling disposed of this trouble.

As to what ought to be expected from commercial samples in regard to iron content, figures are quoted from experience. Taking a complete series of samples, each representing a two-hundredweight charge, out of two hundred and ten samples 87 per cent. of these samples showed an iron oxide content between 30 and 33 per cent.; 4 samples contained from 29 to 30 per cent. iron oxide and 9 samples from 33 to 34 per cent. Several of the latter samples were specially dried for export.

GENERAL REMARKS

There is the question as to what iron and ammonium citrate really is; whether it is a highly basic iron citrate, partly ferrous citrate or a mixture of iron citric compound holding in loose combination an amount of colloidal hydroxide, assisted perhaps by some protective action of the ammonium citrate. We are unable to suggest any answer to this question, but we put forward one or two points for consideration. Two solutions of scales were dialysed. The portions remaining in the dialyser were re-scaled and then contained approximately 53 per cent. of iron oxide, together with citric acid and 2.5 per cent. of ammonia. Following this a special iron hydroxide was prepared having the gelatinous character of the precipitate formed in the usual analytical operations; with this an iron and ammonium citrate was produced containing 37 per cent. of iron oxide. The digestion with citric acid was carried out in the cold over-night, and the subsequent addition of ammonia effected a brilliant solution scarcely requiring filtration. The experiment was repeated, taking considerably less citric acid. In this case some hydroxide remained insoluble, and presumably saturation point was reached. The scales gave 47.4 per cent. of iron oxide; they were almost black in colour and the solution with magnesium sulphate showed no trace of a precipitate after standing for three days, neither did the simple solution. The immediate interest about these experiments is the fact that an iron and ammonium citrate combination of so high an iron content can be effected; but whether the dialysed product and the direct product are of similar constitution has not been investigated.

"We have noticed characteristic behaviour when solutions of different samples are treated with strong acid. If $\frac{1}{2}$ gm. of the sample be dissolved in 10 c.c. of water and 10 c.c. of strong hydrochloric acid added, any of three results may be observed: a brilliant solution on mixing, a very strong turbidity but one which readily redissolves, or a turbidity which is persistent until the mixture is heated. Samples of the latter type usually precipitate with magnesium sulphate, but both former types as a rule are satisfactory. We have thought it possible that the precipitation by hydrochloric acid might indicate the presence of colloidal material when present in excess of a certain amount, and that the different behaviour as to re-solution might be the difference between colloidal iron hydroxide and colloidal basic iron citrate; but that is entirely speculative. The dialysed portion which contained 53 per cent. of oxide and the laboratory preparation with 47 per cent. of oxide, as well as sample five in the table were of the second order."

PHARMACEUTICAL

The main interest of the present subject is the pharmaceutical aspect of the matter. Reference to the tables will show that samples 7 to 10 might with advantage have received considerably more critical attention during manufacture than has been given to them; but, speaking generally, there is no need for serious complaint about the other sample. It is clear that the B.P. article can be and is being produced;

but, while commercial samples may answer present official requirements, quite a number from among such will fail with the magnesium sulphate test, and the position becomes one of uncertainty. If this test be allowed to assume determinative importance, how are the conditions to be met? Is iron and ammonium citrate to remain as now constituted, and the means of satisfying the new test left to the ingenuity or science of the manufacturers—that is to say, left to them in such cases where the objective is as yet unachieved—or should a radical change be made by substituting another variety of the preparation and so either reduce or remove the difficulty. On the other hand, is the precipitation with magnesium sulphate of such gravity and importance as to warrant a radical change? The precipitate is obvious, and is worth avoiding if this can be effected by reasonable means, but in amount it is of the unweighable order and, when shaken up, is often unfilterable. The difficulty is essentially one of variability rather than of intrinsic importance: the difficulty is that when some samples are dispensed a brilliant mixture is sent out, and when other samples are used a yellowish-brown deposit may appear. It is doubtful if the deposit in the medicine bottle will ever weigh as much as one tenth of a grain, yet it may lead to a question being asked by the patient, and that is the whole of the trouble.

EXPERIMENTAL

The determinations were carried out as follows:—

Ammonia.—0.5 gm. was treated with excess of caustic soda and the ammonia distilled into 50 c.c. of a saturated solution of boric acid, the distillate was titrated directly with deci-normal acid and congo red used as indicator. A correction of 0.15 c.c. of acid represented the blank.

Citric Acid.—This was determined by the "wet combustion" method. 0.7 gm. was treated with an acid mixture consisting of 7 gm. of potassium bichromate in solution in 10 c.c. of water and 20 c.c. of phosphoric acid (s.g. 1.75) and heated in the usual manner. The evolved carbon dioxide was led through soda-lime tubes, also with usual precautions, and weighed.

Iron.—This was determined iodimetrically, and we would like to suggest that this method is suitable for adoption as an official test and preferable to that of ashing. In the ordinary way it is unnecessary to pay much regard to the very minute quantities of ferrous iron that may occur in the scales. When that is the case the following procedure is adopted: 0.5 gm. of the scales is dissolved in 10 c.c. of water and then 10 c.c. of hydrochloric acid (s.g. 1.16) added. The mixture is brought to the boil, and boiling the mixture is essential for accuracy. After cooling 4 c.c. of a 50 per cent. solution of potassium iodide are added. Stand about three minutes, then dilute with water to approximately 100 c.c. and titrate with standard thio-sulphate solution. No starch should be used, and the end point is perfectly sharp without any indicator. There may be a slight additional reaction after the assay has stood for a minute or two, but this of course is part of a reversible reaction, taking place after the completion of the determination, and is neglected. Should any serious quantity of iron be present in the ferrous condition, then, to determine the total iron, this must be oxidised. To do this take half a gram of the scales dissolved in 10 c.c. of water and add 5 c.c. of 30 per cent. sulphuric acid. If the mixture is not clear, warm gently until clarity is effected. Cool and add one or two drops of decinormal permanganate solution until a distinct pink colour is obtained. Gently warm to discharge the pink colour and then proceed as before, but in this case take 15 c.c. of hydrochloric acid. This method has been checked against ash determinations on samples of known purity and found in close agreement.

Hydrogen-ion concentration.—This was carried out on solutions of uniform concentration through the medium of the quinhydrone electrode. The experiments were made in order to determine the reaction of the different

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samples in an accurate manner, and it was hoped that these determinations might help to throw some light on the question of the magnesium sulphate precipitations, but unfortunately they have not done so. Nevertheless, they are interesting and provoked a good deal of speculation as to why they vary. The following point is worth attention: when the neutral point is reached, that is to say, when the iron and citric acid combination has been saturated with ammonia and excess of ammonia dispelled by evaporation, and scaling, the PH of the solution is about 7.5.

This acidity reduced, after the addition of ammonia and re-scaling, to the approximately neutral point about PH 7.6. It is worth emphasis that by preparing iron and ammonium citrate in the correct manner a PH of approximately 7.5 is a constant. There is a suggestion of evidence that magnesium sulphate tends to act in opposite directions within different ranges of PH: thus, at certain acidities it tends to depress the hydrogen-ion concentration, and at lesser acidities the tendency is to increase the concentration. Examples of the first case are samples 1 and 5 where the original acidities represented by PH and 3 are reduced by magnesium sulphate to those represented by PH 5.65 and 3.4. The second case includes the remaining samples where the original acidities, at and less than that represented by PH 5, are all increased (numerical reduction in PH).

SUMMARY

Iron and ammonium citrate B.P. is a neutral body. It should contain iron 7 to 8 per cent. of ammonia, and from say 53 to 57 per cent. of citric radicle ($C_6H_5O_7$), and its solution in water gives a PH of about 7.5. Samples may be perfectly satisfactory as to present B.P. requirements, yet may precipitate when in solution with magnesium sulphate. The reasons for the said precipitation have not been elucidated, but the cause is some fault associated with the iron hydroxide used for the preparation. Increase in the acidity is not a general corrective for the trouble. Iron and ammonium citrate can be prepared containing up to about 50 per cent. of ferric oxide and give satisfactory solutions in water and with magnesium sulphate.

DISCUSSION

Mr. DEANE pointed out that manufacturers are troubled with customers who demand a salt passing the magnesium sulphate test. As a rule, he found that the iron content tended to be higher than laid down in the British Pharmacopœia. Different lots with very

nearly the same percentage composition behaved very differently.

Mr. JACKSON foresaw trouble for the panel chemist with this salt. There was a tendency to eliminate from the B.P. all instructions for the manufacturer.

Mr. MARRIS suggested that the properties of scale preparations were only constant when constant quantities and qualities of materials were used.

Mr. FERREY remarked that he had found samples containing an appreciable amount of calcium sulphate. If a dispenser made up a mixture from such a sample, there would be trouble. Samples which precipitated in aqueous solution usually behaved themselves in magnesium sulphate solution.

Mr. LESCHER said that the subject was of importance to manufacturers, as they were liable to prepare a sample which satisfied the B.P. test and have it rejected because of this other test.

Mr. BULL inquired whether any sample satisfied both the B.P. test and the magnesium sulphate test.

Mr. CORFIELD said he was unable to appreciate the importance of the magnesium sulphate test.

Mr. MARRIS referred Mr. Corfield to a typical prescription in "The Art of Dispensing."

Mr. JONES, in reply to the points raised, said he did not think that manufacturers would get together and agree on methods and tests. The whole difficulty was that "good scale" would sometimes answer the magnesium sulphate test and sometimes not.

The authors were thanked by the chairman.

The last paper presented was:—

Adjustment of Achromatic Indicators

By E. LESTER SMITH

[ABSTRACT]

THE term "achromatic indicator" is suggested for a mixture of indicators, or an indicator and a dye, such that the colour of one is complementary to that of the other at the mid-point of its colour change, so that the colour at the transition point is grey. Mixtures containing phenolphthalein may be prepared with a transition point at any PH between PH 8 and PH 10. The extreme sensitivity of these achromatic indicators renders them suitable for the titration of coloured, turbid or very dilute solutions, or of polybasic acids, and for use in artificial light. An indicator mixture, achromatic at PH 4.5 and PH 8.5, can be used for the

TABLE I.—RESULTS OF ANALYSIS OF TRADE SAMPLES OF IRON AND AMMONIUM CITRATE EXPRESSED AS PERCENTAGES ON THE UNDRIED SCALES

	B.P.	1	2	3	4	5	6	7	8	9	10
Fe ₂ O ₃	31.00	30.67	30.75	30.00	29.65	29.70	29.50	29.10	28.60	27.70	26.00
H ₃ C ₆ H ₅ O ₇ 1Aq.	59.70	61.70	61.31	60.41	63.09	61.32	59.72	63.87	62.11	61.11	63.47
NH ₃	8.00	7.89	6.29	6.27	7.34	4.34	6.86	4.46	5.93	5.10	7.20
Re-scaled NH ₃ ¹	—	—	8.27	—	—	7.04	—	7.33	—	7.37	—
PH original	—	7.48	4.0	6.35	7.35	3.0	6.27	5.00	6.80	6.25	7.15
PH MgSO ₄	—	6.78	5.65	5.83	6.65	3.4	6.10	3.24	5.15	4.88	6.35
PH re-scaled ¹	—	—	7.65	—	—	7.55	—	7.50	—	7.60	—
Deposit with MgSO ₄ overnight	—	v.s.	v.s.	soon	at once	nil ²	at once	nil ³	soon ⁴	v.s. ⁵	nil

¹ Sample 5 treated in solution with ammonia and then re-scaled.

² Re-scaled, also nil.

³ Re-scaled, precipitated at once.

⁴ Adding ammonia precipitate disappeared.

⁵ Re-scaled nil. v.s. Very slight.

TABLE II.—THE RESULTS FROM TABLE I. PROPORTION TO A COMMON BASIS OF 21.7 PARTS Fe (31.0 per cent. Fe₂O₃), SHOWING THE VARIATIONS IN THE CITRIC ACID AND AMMONIA

	B.P.	1	2	3	4	5	6	7	8	9	10
Fe	21.70	21.70	21.70	21.70	21.70	21.70	21.70	21.70	21.70	21.70	21.70
C ₆ H ₅ O ₇	{ 53.70 to 56.5 }	56.47	55.62	56.23	59.32	57.61	56.46	61.29	60.57	61.53	68.24
NH ₄	8.47	8.49	7.20	6.86	8.12	4.80	7.63	5.03	6.81	6.04	9.68

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titration of the first and second hydrogen-ions of phosphoric acid.

The majority of the available indicators can be divided into five groups, from the point of view of their colour changes from the acid to the alkaline side of their range:—(1) Red to blue; (2) red to yellow or vice versa; (3) yellow to blue; (4) colourless to red; (5) colourless to yellow. The first group comprises congo red, litmus and lacmoid, none of which are sufficiently sensitive, in comparison with other indicators covering similar ranges, to be worth consideration. The second group is the largest and contains many very useful and sensitive indicators. Thymol blue (acid range), methyl yellow, methyl orange, methyl red, neutral red, phenol red, and cresol red, can easily be converted into super-sensitive "neutral tint" or "achromatic" indicators, by the addition of the correct quantity of a suitable blue or greenish-blue dye such as methylene blue, acid green, or brom-cresol green (above Ph 5). The advantage of using another indicator where possible is that a second range becomes available; this can be utilised to give warning of the approaching end-point. The procedure may be illustrated for the combination of phenol red and brom-cresol green. In solutions more alkaline than Ph 5 the latter is blue, a colour complementary to the orange of phenol red at about Ph 7.4. Alcoholic solutions of the two indicators were mixed in various proportions, and tested, either by slowly adding alkali to water slightly buffered with potassium dihydrogen phosphate and tinted with the indicator, or by adding the latter to a series of buffer solutions. A 3:1 mixture of phenol red and brom-cresol green changed from bright green, through muddy green at Ph 7.1, an indefinite orange at Ph 7.15, and a muddy purple at Ph 7.2, to brilliant violet. With a 3:1.2 mixture the transition point was slightly clearer and displaced to Ph 7.25; with a 3:1.4 mixture it was at Ph 7.3, while the best combination was a 3:1.5 mixture, which changed from bright green through grey green at Ph 7.3, pure grey at Ph 7.35, and violet grey at Ph 7.4 to purple. As the proportion of the blue dye was increased the brilliancy of the green on the acid side was improved, while the violet on the alkaline side deteriorated. If it was further increased, the colour at the transition point became blue-grey. It will be observed that the Ph at the transition point can be adjusted slightly by varying the proportion of the indicators, but that only one mixture gives perfect neutralising of colours to a pure grey, which appears quite colourless if the minimum of indicator is used. At this point a change in Ph of 0.05 units can easily be detected even in artificial light. The third group of indicators, given a yellow to blue colour change, comprises brom-phenol blue, brom-cresol green, brom-thymol blue, and thymol blue (alkaline range). It is evident that it should be possible to neutralise the green colours at the middle of their ranges, with a suitable red dye, giving a colour change from orange through grey to purple-blue. A suitable mixture is alizarin red 0.08 per cent. and brom-thymol blue 0.09 per cent. This gives a colour change from orange red to orange grey at Ph 6.8, pure grey at Ph 6.9, blue grey at Ph 7.0 to clear purple blue. The change is not quite so sharp as that of the modified phenol red indicator, but much sharper than that of any simple indicator. The mixture is especially useful in that the change occurs almost exactly at Ph 7: it also has a second range from yellow to orange red between Ph 4 and Ph 6, which serves, in titrations with alkali, to give warning of the approaching end-point. Brom-cresol green (0.4 per cent.) with neutral red (0.09 per cent.) gives another useful indicator mixture, showing precisely the same colour changes, but with the transition point at Ph 4.5. In these respects it is similar to the "4.5 indicator" already on the market. It has proved extremely useful in titrating micro-Kjeldahl distillates, since the end-point is sharp to one drop of N/50 alkali under the conditions used, while it is sufficiently displaced to the acid side not to be affected by carbon dioxide. The necessary cor-

rection for the deviation of the end-point from Ph 7 is automatically introduced by titrating a blank under the same conditions. An ingenious micro-method for ammonia estimation, in nitrogen determinations by the micro-Kjeldahl method, is one in which the ammonia is aspirated into 3 per cent. boric acid tinted with brom-cresol green, which is then directly titrated with acid to its initial Ph of 4.4, the mid-point of the brom-cresol green range. The method is commendably simple, but insufficiently sensitive for accurate work, owing to the buffering action of the boric acid and the consequent blunt end-point. This difficulty is largely overcome by the use of the brom-cresol green neutral red mixture in place of the unmodified indicator. The mixed indicator has a second range, from purple-blue to green blue between about Ph 7 and Ph 8, due to the colour change of the neutral red; this is, however, not very distinct owing to the small proportion of neutral red present. It should be noted that by merely altering the proportions in which the indicators are mixed, the blue of the brom-cresol green can be used to neutralise the orange colour of the neutral red at its transition point, giving an achromatic indicator with purple to grey to green, colour changes; this is effected by mixing one part of brom-cresol green with two of neutral red, the transition point occurring at Ph 7.35. The mixture has a second range, rose to purple, at about Ph 4 to Ph 5. Brom-phenol blue may be neutralised similarly with methyl red, but the end-point is not very satisfactory, owing to dichroism; the liquid appears one colour in thick layers and a quite different colour in thin layers. Under these conditions it is impossible to obtain a grey neutral tint. Thymol blue (alkaline range) may be neutralised by a trace of phenol red. The fourth indicator group, colourless to red, comprises phenolphthalein and cresolphthaleins only. These indicators are not entirely satisfactory for titrations, inasmuch as the Ph at which the pink colour just appears or disappears depends on the concentration of indicator in the solution. This very disadvantage can be turned to advantage by combining the indicator with a dye of the complementary colour, namely, green. Conditions are not quite the same as with the two-colour indicators, since the actual shade of colour does not alter, but only the intensity, on adding alkali to phenolphthalein, for example. The colour of the green dye chosen should therefore be exactly complementary to that of the indicator if a true neutral tint is to result, but by varying the proportion of this dye mixed with the phenolphthalein, a series of indicators can be prepared which give transition points at any Ph within the phenolphthalein range of Ph 8 to Ph 10. It has been found that a satisfactory green is given by the mixture of methyl red and methylene blue, 2:1, which itself forms a satisfactory achromatic indicator, with a colour range at Ph 5.4. It was tested, mixed with phenolphthalein in the proportions given below, and gave a series of very sharp indicators, changing from green, through green-grey, grey and purple-grey, to rose, the end-point being sensitive to a change in Ph of 0.05 units or less, except for the last mixture, which is slightly less sensitive.

Composition of mixture			Ph at Transition point
Methyl red	Methylene blue	Phenolphthalein	
2	1	100	8.35
2	1	30	8.55
2	1	15	8.80
2	1	7.5	9.00
2	1	3.0	9.40
2	1	1.9	9.80

The fifth group of indicators comprises the various mono-, di- and tri-nitrophenols, which give colourless to yellow changes at different Ph values. It was hoped that it might prove possible to neutralise the colour of these indicators with a purple dye, and so develop a series of achromatic indicators similar to those described for phenolphthalein. Unfortunately,

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however, the dyes which we have tested all give dichroic effects in combination, for example, with *p*-nitrophenol, so that no neutral tint can be obtained, and the colour change is not sharp; moreover, the appearance of the faint yellow tint on the alkaline side of the transition point is not easy to see, especially in artificial light.

Some points of contrast and similarity between these achromatic indicators and the ordinary one-colour and two-colour indicators may be mentioned. In some respects the achromatic indicators resemble extremely sensitive one-colour indicators; passing in either direction from the transition point, a definite colour appears, at first faint, then of intensity increasing to a maximum, but the shade of colour does not vary, if the correct proportion and shade of the complementary colour has been used in making the mixed indicator. The colours are rather less clear than those of the one-colour indicators, however, since the transition colour is grey; if so little indicator is used in a titration that this grey is not noticeable, the colour close to the transition point is very pale. In the case of most two-colour indicators, on the other hand, the total intensity of colour is approximately constant, but the shade varies continuously. For the determination of PH of a liquid, however, this property of the two-colour indicators is an advantage; a definite shade corresponds to a given PH, independent, within limits, of the concentration of indicator. The one-colour indicators, such as phenolphthalein, are of little value for the determination of PH, since their colour intensity is a function not only of PH, but also of indicator concentration, so that the latter must be standardised. Although the achromatic indicators are more sensitive, they suffer under this same disadvantage, and are not to be recommended in general for PH determination. In the immediate neighbourhood of their transition points, however, they resemble more closely the two-colour indicators, and on account of their very sharp colour changes, they may find some application over these limited PH ranges. A number of titrations for which achromatic indicators are peculiarly useful have already been mentioned. It may be emphasised, however, that they are very suitable for the titrations of coloured liquids. An indicator should be chosen with colours different from that of the solution itself, the purple to grey to green type being usually best. A flask of the solution is stood on a white tile beside the titration flask; at the end-point, the shade of the two solutions should be the same, except that the one containing the indicator will appear slightly darker or muddy. Special mixtures of indicators may be developed for particular titrations—titration of phosphoric acid; dimethylamino-azobenzene used to indicate the neutralisation of the first hydrogen, cresol red the second, and cresol red in presence of calcium chloride the third, the solution being titrated at 70°C. in the last case. These indicators are somewhat less sensitive than the paper indicators, and we have endeavoured to replace them with suitable achromatic indicators. With the indicators suggested, the end-point occurs towards the alkaline side of their respective ranges; it seemed of little value to add dyes of complementary colour, since the grey transition point would occur at the wrong PH, a conclusion that was confirmed by experiment. The modified brom-cresol green indicator, with transition point at PH 4.5, suggested itself for titration of the first hydrogen ion, and proved entirely satisfactory. One of the modified phenolphthalein indicators seemed an obvious suggestion for titration of the second hydrogen, and again proved satisfactory. The problem arose of combining these into a single mixture which would indicate both PH ranges without mutual interference of colours. The modified brom-cresol green is blue in solutions more alkaline than PH 5. The addition of nitrophenol is without effect in acid solution, since it is then colourless, but in solutions more alkaline than PH 7 it is yellow, giving with the brom-cresol green a green colour, approximately

complementary to the red of phenolphthalein. The mixture finally adopted contains:—

Brom-cresol green	...	...	...	0.02 gm.
Neutral red	...	...	...	0.0045 gm.
<i>p</i> -Nitrophenol	...	...	...	0.05 gm.
Phenolphthalein	...	...	...	0.60 gm.
Alcohol	...	...	...	100 mil.

This gives the colour changes, orange, through grey at PH 4.5 to blue, changing slowly to green, then through grey at PH 8.5 to red. The mixture shows slight dichroism in the second range, but nevertheless gives a very sharp colour change in the titration of phosphoric acid.

There was no discussion.

The following papers were taken as read:—

Diastatic Power of Malt and Malt Extract

By C. T. BENNETT and F. C. L. BATEMAN

[ABSTRACT]

THE primary object of this note is to call attention to the fact that even with the most recent modifications the Lintner test is unsatisfactory and leads to varying results in different laboratories. Under the National Mark scheme, standards have been fixed for four grades of malt extract. The method of determination is described very fully in the Appendix 3 of the Marketing Leaflet No. 14, issued by the Ministry of Agriculture. Directions are given for the preparation of the soluble starch, and full details are specified for the conditions of time and temperature for the starch conversion, and for the method of titration, in which methylene blue is used as an indicator. In the final paragraph, it is stated that "it will be found advantageous to make simultaneously control determinations on a malt flour or syrup of known activity." This statement implies that the method is unreliable without such a standard. If an analyst has a sample of malt or malt extract to test, and has no standard sample, his results may differ very considerably from results obtained in another laboratory, although he may carry out the process to the letter. Even if he makes his own soluble starch he cannot rely on the product any more than on the purchased article. Owing to the differences in results between our own determinations and others, we have distributed samples of extract of malt and ground malt amongst several analysts of repute, and have been astonished at the variations shown. (Examples are given.) Ground malt gives larger differences owing to the higher figure and the two processes involved, mashing and starch conversion. We have endeavoured to trace the causes which lead to the differences, and have come to the conclusion that whereas the soluble starch is the chief difficulty, other factors also have an appreciable effect. Careful attention must be paid to the following details in order to obtain consistent results even in the same laboratory:—(1) The soluble starch must be identical; (2) the distilled water must be specially prepared; (3) the atmosphere of the laboratory must be ammonia free; (4) the temperature for digestion and starch conversion must be carefully regulated; (5) frequent agitation is necessary during the processes of digestion and starch conversion. Independent observers confirm the truth of these statements.

The soluble starch offered in commerce for analytical purposes appears to differ considerably, and malt experts do not rely on it but prepare their own and reject those samples which are not up to a certain standard. The original Lintner test was described in 1886, and since then various modifications have been proposed. The Lintner value is defined as 100 when 0.1 c.c. of a 5 per cent. solution converts enough starch in one hour at 70° F. to reduce 5 c.c. of Fehling's solution. The official method is based on a report published in 1922 by the Institute of Brewing, and modified by the use of a buffer solution. The temperature of 70° F. originally proposed by Lintner for the starch conversion might well be raised to 40° or 45° C., at which temperature

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the diastatic power is much greater. (Three tables show results obtained with samples of starch, arrowroot and malt in the laboratories of Wright, Layman & Umney, Ltd.) Owing to pressure of other work, no definite suggestions can be made as to the best method of carrying out tests for diastatic activity. The authors think, however, that sufficient evidence has been put forward to show that the test adopted by the Ministry of Agriculture needs amendment before it can be considered suitable for inclusion in the British Pharmacopœia. It is questionable whether a standard for diastatic power is necessary for a pharmaceutical malt extract. If it is administered for its diastatic activity, its power of converting starch into sugar is limited by the amount given and also by the action of the digestive juices. If it is given as a food, or as a vehicle for administering cod-liver oil, no test for diastase appears to be necessary.

Variation in Colour-Test Value of Commercial Samples of Cod-Liver Oil

By F. J. DYER and FRANK WOKES

[ABSTRACT]

MANY workers have brought forward evidence in favour of the suggestion that the intensity of blue colour produced by this reagent on cod-liver oil and other potent sources of vitamin A can be employed to measure the relative potency in this factor. While in no way committing themselves to the specificity of this test, the authors thought it would be of interest to examine a series of commercial samples of cod-liver oil in order to determine what intensity of blue colour might be expected to be obtainable from average samples of oil as they actually reach the public. Twenty-four samples of cod-liver oil were purchased from retail dealers in different parts of the country. Three of these were from drug stores and twenty-one from pharmacists. A list of these samples, with the district in which each was obtained, and details of packing, is given. These samples were stored in a cool place away from direct sunlight, and tested within a few weeks of being received. The method of Carr and Price was followed, with certain modifications. A solution of the oil was made in chloroform which had been dried over anhydrous calcium chloride. This solution was made of such a concentration that under the given experimental conditions the initial intensity of blue colour produced lay between four and eight Lovibond units. The antimony trichloride reagent was prepared by shaking slight excess of antimony trichloride with anhydrous chloroform at room temperature at intervals during several days until a saturated solution was obtained.

When the test was being carried out 0.22 c.c. of the freshly prepared solution of the oil was put in a clear glass test tube of 1 c.m. internal diameter. At a given time 2 c.c. of the antimony trichloride solution was added, the two solutions rapidly mixed by twirling, and the tube placed in position in a Lovibond tintometer. The blue colour thus produced was matched against Lovibond glasses, with addition of red and yellow if necessary, the reading being taken exactly thirty seconds after mixing. It was sometimes noticed that the intensity of blue colour had commenced to fade before the reading was taken, in which experiments the reading actually recorded is a little lower than the initial or maximum intensity. By taking readings on such oils at sixty and ninety seconds there was obtained a curve for the rate of fading of the blue colour in each experiment. From this curve it was possible to calculate what the blue reading would have been if it had been taken at the point of maximum intensity, which is usually about fifteen or twenty seconds after mixing. The difference between this calculated maximum value and the reading recorded at thirty seconds was usually only about 5 per cent., and always less than 10 per cent. of the recorded value. The twenty-four oils were examined independently by each of the two authors. On each oil, after preliminary rough trials, at least three accurate readings were made,

and the average of these was taken. The results obtained independently by each observer on the twenty-four oils are summarised in the following table:—

No. of sample	Tintometer readings in Lovibond blue units		
	F.J.D.	F.W.	Average
A1	4.5	4.8	4.65 ± 0.15
A2	6.1	5.6	5.85 ± 0.25
A3	6.2	6.1	6.15 ± 0.05
A4	4.9	4.6	4.75 ± 0.15
A5	7.2	7.4	7.1 ± 0.1
A6	3.2	3.8	3.5 ± 0.3
B1	5.8	4.9	5.35 ± 0.45
B2	6.8	7.0	6.9 ± 0.1
B3	6.0	6.2	6.1 ± 0.1
B4	4.4	4.1	4.25 ± 0.15
B5	7.6	8.4	8.0 ± 0.4
B6	4.3	4.7	4.5 ± 0.2
M1	6.2	5.2	5.7 ± 0.5
M2	3.8	4.5	4.15 ± 0.35
M3	6.2	6.9	6.55 ± 0.35
M4	4.7	5.3	5.0 ± 0.3
M5	3.0	3.0	3.0 —
M6	9.8	8.2	9.0 ± 0.8
1	6.5	6.4	6.45 ± 0.05
2	5.8	5.8	5.8 —
3	5.0	4.7	4.85 ± 0.15
4	5.0	5.2	5.1 ± 0.1
5	4.3	4.7	4.5 ± 0.2
6	8.2	9.2	8.7 ± 0.5
Average	5.65	5.69	5.67

Six of these samples were stored in amber bottles. The colour test values for these ranged from 4.15 to 8.7, and averaged 6.2. The colour test values for the seventeen oils stored in white glass bottles ranged from 3.0 to 9.0 and averaged 5.6. One oil stored in a blue glass bottle had a colour test value of 3.5. One of the oils stored in amber bottles was found to be over two years old. This oil (M2) had the lowest colour test value of all the oils stored in amber bottles. If M2 be omitted from the list the other five had colour test values ranging from 5.1 to 8.7 and averaging 6.6. Oil M2 is also interesting, because it was physiologically tested in the Pharmaceutical Society's laboratory in 1927, and produced satisfactory resumption of growth in doses of 10 mgm. Its colour test value in 1927 was 5.3. Thus it had dropped from 5.3 to 4.15 during two years' storage in amber glass bottles, representing a loss of only about a fifth of the initial activity, as measured by the colour test. The two other oils which had been physiologically tested (B2 and 6) both gave higher colour test values—6.9 and 8.7 respectively. From the results on the twenty-four samples of oil it would appear that cod-liver oil, as it reaches the consumer in this country, contains on the whole a reasonable amount of activity as measured by the colour test. Experience gained in examining many samples suggests that a satisfactory sample of cod-liver oil should not give a colour test value below 4.0, and only two samples out of twenty-four came below this figure.

The authors draw attention to a dangerous practice which has recently arisen of attempting to translate colour-test values of cod-liver oil and other preparations of vitamin A into so-called "biological units." This procedure may lead to misleading conclusions regarding the value of the oil, and is quite unjustifiable. Much experience in the testing of cod-liver oil has shown that the experimental error, when applying colour tests and feeding tests to the same oil, is so large as to make any numerical comparison between the two results highly problematical. In the present position any worker who employs a ratio between colour-test values and feeding test results obtained in experiments subject to such high errors, in order to convert a colour-test value into so-called "biological units," is merely producing results which can have no scientific value. The only reasonable procedure is to determine the average colour value of a representative

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series of oils which have been found by feeding experiments to contain satisfactory amounts of vitamin A, and to decide what deviation below that average is justifiable in samples of oil as they reach the public.

Glass Electrode Studies : I—Some Oxy-Acids of Phosphorus

By C. MORTON

[ABSTRACT]

In analytical practice it is frequently necessary to estimate hypophosphites in the presence of phosphites and/or phosphates, or pyrophosphate in the presence of phosphate. Apart from its theoretical interest, therefore, a knowledge of the neutralisation curves is of some practical importance. The conductivities of hypophosphorous and phosphorous acids at various dilutions have been measured by Kolthoff, but the titration curves do not appear to have been determined, probably owing to the fact that the hydrogen electrode gives unreliable results in the presence of powerful reducing agents. The glass cell of Haber and Klemenciewicz provides a means of measuring potentials which are otherwise inaccessible. This electrode has been used in the potentiometric titration of hypophosphorous and phosphorous acids with NaOH: the results of hydrogen electrode titrations of glycerophosphoric and phenylphosphoric acids with NaOH and of trisodium phosphate and sodium pyrophosphate with HCl are also given. The titration curves of phosphorous, glycerophosphoric, and phenylphosphoric acids are similar in form to the well-known phosphoric acid curve: in each case there is an inflection at PH 3.4–4.5, and a second inflection at PH 8.4–9.2 corresponding to the formation of the mono- and di-sodium salts respectively. The neutralisation curve of hypophosphorous acid is that of a strong monobasic acid. In the displacement curve of sodium pyrophosphate a slight inflection corresponding to the formation of the tri-sodium salt $\text{Na}_3\text{HP}_2\text{O}_7$ is just discernible, and there is a more pronounced inflection at the half-displacement point ($\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$). The PH values at the various equivalence points, as determined from the maxima of the $\Delta \text{PH}/\Delta V$ curves, are given by the author in tabular form.

EXPERIMENTAL

The temperature employed was 18°C . The glass electrode consisted of a thin bulb of high conductivity glass filled with approximately $N/5$ HCl saturated with quinhydrone and immersed in the solution in the titration vessel. The potential difference between a platinum electrode immersed in the quinhydrone buffer and a saturated calomel electrode connected with the solution in the titration vessel by a KCl bridge was measured by a ballistic method. The system which forms the cell of the type was allowed to charge a mica condenser; the con-

Pt.	N/5HCl quinhydrone	Glass membrane	Unknown solution	KCl (sat.) HgCl	Hg
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denser was subsequently discharged through the high sensitivity galvanometer of the Cambridge Instrument Company. The galvanometer has a period of 22 seconds and a ballistic sensitivity of approximately 3,000 mm. per microcoulomb at one metre. The capacity of the condenser was 0.1 mfd. and the charging period one minute. The system was calibrated empirically by means of standard buffer solutions, and a graph was constructed from which the PH value corresponding to a given deflection could be determined: in this way errors due to non-linearity of the E.M.F.- P relationship of the glass, asymmetry of the galvanometer field, irregularities in the graduation of the galvanometer scale, etc., were eliminated. In the neutral salt experiments, 10 c.c. of the phenylphosphate mixture, successive increments of N-KCl , N-NaCl , $\text{M/3 K}_2\text{SO}_4$, M/3 BaCl_2 , or M/4 MgSO_4 were added, and the PH (or pK_2) change determined by means of the hydrogen electrode.

SUMMARY

(1) The neutralisation curves of hypophosphorous and phosphorous acids have been determined by means of the glass electrode, and those of glycerophosphoric, phenylphosphoric, pyrophosphoric, and orthophosphoric acid by means of the hydrogen electrode.

(2) Volumetric determination of the oxy-acids of phosphorus has been discussed. It is shown that the B.P.C. method of estimating hypophosphorous acid volumetrically includes phosphite and/or phosphate.

(3) The apparent dissociation constants of the six oxy-acids which have been determined from the titration data.

(4) The thermodynamic second dissociation constant of phenylphosphoric acid has been determined from measurements of the PH changes produced by the addition of neutral salts to a partially neutralised solution of the acid.

The author expresses his indebtedness to the Cambridge Instrument Co., Ltd., for the loan of apparatus, and to Dr. J. C. Crocker for the interest he has taken in the work.

Note on Extract of Colocynth

By E. M. SMELT

[ABSTRACT]

In the course of the revision work for the Pharmacopoeia Commission an investigation with a view to finding the best method for preparing an alcoholic extract of colocynth was required. An extract was prepared by the method given in the U.S.P. X. for extractum colocynthidis, but using 60 per cent. alcohol instead of diluted alcohol U.S.P., which corresponds to not less than 48.4 per cent. and not more than 49.5 per cent., by volume, of $\text{C}_2\text{H}_5\text{OH}$. Working with 200 gm. of drug and 60 per cent. alcohol, and following the U.S.P. instructions, it was found that the preparation could not be completed, as the amount of extract obtained exceeded 50 gm., whereas according to the U.S.P. it should be made up to that weight by the addition of dried starch. On repeating the experiment, but using diluted alcohol U.S.P., the weight of extract obtained was still greater. Reference to the literature produced very conflicting evidence.

In the circumstances it was considered advisable to carry out experiments with other samples of colocynth. For this purpose eight samples of colocynth pulp were obtained. Before determining the alcoholic extracts, the quantity of moisture in each specimen was ascertained, in order to make sure that any exceptional results were not caused by excessively high or low moisture contents.

Two methods were employed for each determination:—

(i) *Maceration Method*.—Five gm. of the pulp reduced to about No. 20 powder was introduced into a stoppered bottle. 150 millilitres of the required alcohol was added, and the whole shaken until well mixed. The mixture was allowed to macerate for five days, shaking from time to time. The liquid was then filtered off, and the quantity of extractive determined by evaporating 25 millilitres in a flat-bottomed glass dish and drying to constant weight at 105° to 110°C .

(ii) *Percolation Method*.—Five gm. of the powdered pulp was moistened in the usual way with sufficient of the required alcohol, and allowed to macerate for four hours in a closed container. The moist powder was then transferred to a percolator. Sufficient alcohol was added to saturate it and leave a layer of menstruum above it. Maceration was then continued for twenty-four hours, after which percolation was allowed to proceed at the rate of about one drop a minute until the drug was exhausted. This was ascertained by evaporating a few mm. of the percolate until the weight of the residue was inappreciable. Each percolation took rather over two days to complete. An aliquot portion of percolate was evaporated and dried as before, and the percentage of extract calculated. (The author gives tabulated results.)

The results show that the weights of extract obtained from all the specimens which complied with the B.P. and U.S.P. descriptions, except the Egyptian variety,

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were considerably in excess of the weight specified in the U.S.P. formula for extract of colocynth. In addition, one of the rejected samples gave an extract of over 25 per cent. with diluted alcohol U.S.P., although it yielded less than 25 per cent. of extract to 60 per cent. alcohol. Further, extracts dried on a water or steam bath in large quantities might regain more moisture than similar extracts dried in experimental quantities. In every case, the quantity of extract obtained with diluted alcohol U.S.P. is greater than that obtained with 60 per cent. alcohol. One is therefore led to conclude that the monograph for extract of colocynth in the U.S.P. X. requires revision.

Gravimetric Electro-Deposition of Metals and its Application to Pharmaceutical Chemicals (II)

By S. GORDON LIVERSEDE

[ABSTRACT]

SINCE a paper on this subject, presented to the Conference last year, the author has been able to carry out numerous routine analyses of fine chemicals almost daily by means of Sand's electrolytic apparatus.

BISMUTH

It is necessary from time to time to determine the percentage of bismuth remaining in the "liquors" from which the pure salts of bismuth have been removed. Electrolysis, using a rotating anode, provides a rapid method whereby metallic bismuth is quantitatively deposited on the cathode from a faintly acid solution of bismuth and ammonium citrate even in the presence of a large amount of iron. The equivalent of 0.5 c.c. bismuth "liquor" was accurately pipetted into a small beaker, 2 gm. citric acid added, followed by ammonia in slight excess. The solution was neutralised and left faintly acid with nitric acid, diluted to 70 c.c. and heated to 70° C. when it was ready for electrolysis. No bismuth remained in solution after ten minutes. Certain bismuth compounds have been examined with ease and accuracy by the above method. It is necessary, however, carefully to ignite organic salts before conversion into the double ammonium citrate, but in the case of the subgallate merely to warm the salt gently with dilute NO_3 , when decomposition rapidly takes place. Xeroform (bism. tribromophenol) provides some difficulty since it is not readily soluble in acids or alkalis, and ignition usually incurs loss by "spitting." A satisfactory method is as follows:—0.5 gm. xeroform is boiled with 5 c.c. of NaOH solution (50-per-cent.) and 15 c.c. water. After filtration through a Gooch crucible and washing with hot water, the residue is dissolved in HNO_3 and converted into the soluble ammonium citrate.

CADMIUM

It has been recently shown by E. Collin that it is possible to deposit very small amounts of cadmium quantitatively from zinc solutions by means of "internal electrolysis." This ingenious and simple method suggested by Dr. Sand deserves to be generally known, and the author's results fully confirm those already published. It is necessary to remove other metals if present, such as lead, copper and iron. The solution, which is usually strongly alkaline with ammonia, is made faintly acid to methyl orange with H_2SO_4 . 5 c.c. of a 5-per-cent. solution of ammonium acetate is then added, heated and maintained at a temperature of 70° C. during electrolysis. It was found sufficient to use one anode only and to dispense with the stirrer. In lieu of acid in the anodic cell, a few c.c. of 5-per-cent. sodium acetate solution with 2 gm. zinc sulphate in water was used. To test the method, pure cadmium sulphate was taken which had been found by electrolysis to contain 49.2 per cent. cadmium. A solution was prepared containing 5 gm. $(\text{NH}_4)_2\text{SO}_4$, 2 gm. crystallised zinc sulphate free from cadmium, and 0.0634 gm. cadmium sulphate (=0.0312 gm. Cd.). Using the above method 0.0316 gm. Cd. was found.

TIN

Sand, using gauze platinum electrodes, showed that tin may rapidly be deposited from a solution of tin in H_2SO_4 provided that (1) free oxalic acid is present; (2) 0.1 c.c. to 0.2 c.c. H_2SO_4 is present before the addition of oxalic acid; (3) a temperature near boiling point is maintained, and (4) hydroxylamine hydrochloride is added. Recently, J. Syéda and R. Uzel have investigated this subject and find that both stannous and stannic salts may be satisfactorily electrolysed in the presence of ammonium oxalate, but at a lower temperature than that adopted by Sand. The author has confirmed the general accuracy of their results on metallic tin (Kahlbaum) and stannous chloride. Metallic tin was dissolved by boiling in a small quantity of concentrated H_2SO_4 , and after dilution and partial neutralisation with ammonia, 2.5 gm. oxalic acid, 5 gm. ammonium oxalate and 2 gm. hydroxylamine hydrochloride were added. The clear solution was diluted to 70 c.c. and warmed to 70° C. when it was ready for electrolysis in the usual manner. In both cases the deposit of tin was excellent and conveniently dried by means of alcohol, ether and hot air.

LEAD

It is well known that lead may be rapidly and quantitatively deposited by electrolysis using a rotating anode:—(1) as metallic lead on the cathode; (2) as lead peroxide on the anode. In the case of (1) the cathode must be previously coated with a thin layer of copper before being used for the electrolysis of liq. plumbi subacet. fort., B.P. Take the equivalent of exactly 1 c.c. liq. plumbi, add 1 gm. tartaric acid in water and boil. The addition of a small quantity of KOH quickly effects solution, and after dilution to 70 c.c. electrolysis may be conducted at the normal temperature. Deposition is complete within a quarter of an hour. By electrolysis, lead in samples of tartar emetic was found to vary in quantity from 50 to 1,300 parts per million.

NICKEL AND COBALT

Under conditions given below the author was able to obtain quantitative deposits more quickly. Treadwell and Hall "electrolyse ammoniacal solutions of nickel with a current of 0.5 to 1.5 amperes, and the electrolysis is finished in 2 hrs." They add, however, that "a temperature of 50 to 60° C. reduces the time to one hour and gives a better deposit." By the use of gauze electrodes, one of which rotated, deposition of metal was completed in less than a quarter of an hour even at room temperature by employing a current of 4 amperes. The deposit was easily washed and dried by alcohol, ether and hot air. Metallic nickel was dissolved in moderately strong HCl by continuous boiling, and then diluted to 100 c.c. An aliquot portion was accurately taken, 5 gm. $(\text{NH}_4)_2\text{SO}_4$ added, 25 c.c. NH_4OH (s.g. 0.880), and the clear liquid diluted to 70 c.c.

Cobalt, according to Treadwell, is more accurately and conveniently determined by electrolysis than by any other method. The method adopted is precisely the same as for nickel except that a little more ammonia is added "to prevent the tendency to deposit black $\text{Co}(\text{OH})_3$ at the anode." The author's experience confirms this opinion, to which may be added the fact that deposition is completed within a quarter of an hour if conditions are adopted similar to those given for nickel as described above.

The work was carried out in the laboratories of Howards & Sons, Ltd., Ilford, and the Sir John Cass Technical Institute, London. Throughout the paper results obtained are tabulated.

The CHAIRMAN said they had had excellent papers and discussions, and proposed thanks to the Council of the Society and the editor of "The Quarterly Journal of Pharmacy and Pharmacology." He also thanked the authors of the various papers.

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THE SOCIAL SIDE

The organising powers of Local Executives seem to grow more and more perfect with each succeeding Conference. This year everything in connection with the dispatch of tourists on their tours, the allotment of seats to those who asked for them, and even in the minor matter of cloak rooms, has worked with smooth perfection. We gave the names of those at the head of affairs in a recent editorial article, and we must not make them blush by repeating them. One unusual mark of attention was the suspension of a banner of welcome to the Conference, in English and Welsh, near the City Hall. A transcription of the Welsh greeting, given us by a high authority, reads: "Croesaw i cynhadledd cyferwydd i Cymru." On account of linguistic subtleties we refrain from attempts at translation.

Further investigation in Cardiff has resulted in the discovery of a lady pharmacist in business on her own account, Miss Mary V. Tyler, who qualified in 1928 and has acquired an old-established pharmacy in Bute Town. Miss Tyler, who studied at the Cardiff Technical College, is a steward of the Conference, and has thus a double claim to mention.

Prior to the opening of Tuesday's proceedings a handsome evergreen wreath was laid at the base of the war memorial close to the City Hall. It bore the words:—"British Pharmaceutical Conference, Cardiff, 1930. In fond memory of pharmacists and others connected with the craft, who gave their lives for King and country in the great war, 1914-18." Then followed an inscription in Welsh. Mr. J. Murray (local secretary of the Conference), addressing the chairman, said: I have the honour on behalf of the Local Executive to ask you to perform the ceremony of placing this wreath at the foot of the cenotaph. We feel that this memorable occasion of the visit of the British Pharmaceutical Conference to Cardiff is one on which to pay a tribute to those pharmacists of Great Britain and Ireland who served their King and country so well, even to the supreme sacrifice. The chairman, who was accompanied by the president and several members, then placed the wreath in position.

A fleet of well-appointed motor-coaches left the City Hall on Tuesday afternoon on the ladies' excursion to Barry. The weather, although somewhat cloudy at the start, kept fine. The route lay across the River Taff, along the busy Cowbridge Road, past Victoria Park, and so out into the country. Narrow winding roads were followed through the village of Wenvoe, passing an ancient castle on the right. An excellent view was obtained of the Bristol Channel and the Brecon Beacons. A halt was made at Cold Knap, where the visitors thoroughly enjoyed a walk through the beautiful gardens. The next stop was made for tea. The party was welcomed by Councillor Dr. E. E. Owens, vice-chairman of the Barry County Council, who described the features of the town. He hoped that in the future Barry would develop into one of the most important seaside resorts. Dr. Crossley Holland, in reply, said they owed a debt of gratitude to the pharmacists of Barry and the Town Council for the charming hospitality shown. Barry was excellently planned and full of natural charm. After tea the party returned by another route.

The Conference banquet on Tuesday evening was notably successful in two respects, first in the attendance and enthusiasm, and secondly in the *cachet* that was imparted to the proceedings by the preponderance of the Welsh language in the printed programme and in the music. Even the fare was given in Welsh, as will be seen from the following reproduction of the Welsh portion of the *menu card*:—

Y Ualed.
Cynhadledd Cyffurwyr
Prydeinig
F'w chynnal
yn
Henadd y Bdinäs
CAERDYDD
GORFFENNAF YR 22ain,
1930.

Lwydrestre
 Grawnffrwyth Rhewedig.
 Cawl Gloyw Crwban.
 Ysnodennau o Dorbwt. Sibr Berdys.
 Cloron y Dduces.
 Golwython Cig Oen. Sibr Tymatws.
 Pys.
 Surfedd gyda Maresein.
TOAST: THE KING.
"Here's a health unto His Majesty."
THE PARTY
 Cwennen Syri Bôb. Coesgen Efrog.
 Ffa Ffrengig Gwyrdd. Cloron Crych.
 Eirin Gwlanog Dull Cendé. Siartreus o Fricyll.
 Hufen Orleans. Pasteiod Amrywiol.
 Poten Ia.
 Bysedd Mân Benwaig.
 Grawnwin. Afalau. Bananau. Siocoladau Cudd.
 Coffi.

It would be interesting to know what proportion of the diners knew or even guessed in advance what they were about to receive. A male-voice Welsh choir, gifted with due resonance and *élan*, greatly added to the enjoyment of the occasion.

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Our "Who were There" list will give the names of the company, and it will thus suffice to mention most of those at the chief table—the chairman (Mr. J. T. Humphrey) and Mrs. Humphrey, the Lord Mayor of Cardiff (Alderman W. Charles) and the Lady Mayoress, the president of the Pharmaceutical Society (Mr. A. R. Melhuish) and Mrs. Melhuish, Mr. D. Owen Evans, Dr. G. Claridge Druce, F.R.S., Mr. William Bennett, M.P., Mr. C. Coles, Mr. F. W. Gamble, Professor H. G. Greenish, Mr. L. Moreton Parry, Mr. Herbert Skinner, Mr. R. R. Bennett, Mr. D. Lloyd Howard, Dr. F. W. Crossley Holland, Mr. Philip F. Rowsell, and Mr. S. W. Hague.

The speeches were of quite average Conference standard. Mr. D. Owen Evans, who proposed the toast of "The Pharmaceutical Society of Great Britain," delighted his audience with his understanding of the position of pharmacy in the scheme of things and with his amusing stories. Mr. Evans rightly characterised the hall in which the dinner was held as one of the most notable buildings in Europe. He evoked loud laughter by a chaffing reference to "settlements in North Wales," and, in more serious vein, added that it was time to break down the distinction between a profession and a business. As a member of the public he would prefer that prescribing and dispensing should be done by two different persons. Mr. Evans's reference to a raising of the standard in pharmacy ended with a tribute to the president of the Society.

Mr. Melhuish, in reply, said that the Council based its policy on the education of the members of the Society and the application to pharmacy. The Society endeavoured to keep pace with the ever-increasing needs of medicine and science. Nothing should be able to obscure or submerge the professional basis on which the profession of pharmacy was founded. Pharmacists

owed universities and colleges a debt of gratitude, and to none more than to the Cardiff Technical College. In this connection the president paid a tribute to the late Dr. F. W. Arnald. Referring to the draft Bill, the president remarked that some degree of change in pharmacy was inevitable, but that no narrow or selfish policy would prevail.

Mr. R. R. Bennett, in proposing "The City of Cardiff," said that that city was famous for its hospitality. There were many European capitals which had nothing to show comparable with the municipal buildings of Cardiff. He paid tribute to the genius who created a lofty nationalism in stone, and added that he hoped it would not be long before the export trade of coal from South Wales regained its natural prosperity. Responding, the Lord Mayor outlined the growth of Cardiff, and said that the city was bound to grow. Cardiff, he said, would soon come into its own again as a coal-exporting port. The Lord Mayor pointed out that Cardiff was one of the best centres for industrial settlement; they had plenty of young men and women who were ready to take up any new industry.

"The Conference" was proposed by Principal Charles Coles, who said he had never seen a conference arranged on more methodical lines. Speaking of the Welsh College of Pharmacy, he mentioned that every student trained in that centre during the past eleven years had a post or owned a business. Welshmen, he thought, had a special aptitude for pharmacy. Mr. J. T. Humphrey (chairman of the Conference), responding to the toast, thanked the local Executive and all their friends in Cardiff for the wonderful way in which they had been received. During his career he had been in close touch with Cardiff chemists, and he thought the choice of Cardiff as a conference centre was a wise one.

THE CHAIRMAN OF THE CONFERENCE
PLACES A WREATH AT THE WAR
MEMORIAL



TWO CONFERENCE VETERANS:
Mr. P. F. Rowsell and Dr. G.
Claridge Druce



TWO NORTHERN COUNCILLORS:
Messrs. T. Hardy and
E. H. Simmons



EARLY ARRIVALS:
Messrs. Hardy, Ashworth,
Scholes, Simmons and
D. H. Evans

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Mr. S. W. Hague proposed "Our Guests," and said he hoped the delegates would feel they were being received in the friendliest spirit. Responding to the toast, Dr. D. Llewellyn Williams remarked that he had very pleasant recollections of pharmacists, who were men of integrity and honour. It was his duty to scrutinise the reports of public analysts, and he could say that the present-day pharmacists were accurate and honourable in their dealings with the public. Dispensing was wonderfully well done, and was a great credit to the chemists. This was the day of specialists; he suggested that pharmacy was no longer a handmaid of medicine but an honourable and distinguished partner. With this handsome tribute the speeches ended, and the excellent choir of male voices gave further selections.

An unexpected visitor joined the Conference on Wednesday in the person of Professor Arthur H. Bryan, of the School of Pharmacy, Baltimore, U.S.A. Professor Bryan, who was returning to Baltimore, had the good fortune to meet Mr. John Davies, of Tony-pandy, and in the course of conversation discovered that the Conference was in progress. With true western hustle he immediately changed his plans and proceeded to Cardiff to enjoy the hospitality of his British *confrères*.

The two thrones of the Conference, the chairman's and the president's, have never been occupied to greater advantage than this year. Something is said on another page of this issue of Mr. Humphrey's exceptional experience in almost every sphere of pharmacy that one can mention; and, as might have been expected, his manifold duties as chairman have been performed with a mingled tact, ease and authority that will long remain in the memory. It must have been gratifying to him to find that the attendance in the Science Section was well above the average of recent years, and that the discussions were well diffused instead of being, as in some past years, practically confined to a few veterans. We have mentioned the chairman first since his name, for some unknown reason,

appears in the official red book of Conference papers without that of the president; but the fact is that Mr. Melhuish has proved by no means a simple figure-head. He has won golden opinions by his accessibility and courtesy, while his public appearances have upheld the dignity of his important position without apparent effort or pose. So happy a combination of talent in the chosen leaders has been productive of the best results.

The excursion to Caerphilly Castle on Wednesday afternoon was full of charm, in spite of a threatening sky that fortunately did nothing much worse than threaten. South Wales differs from North Wales, as a local authority pointed out to us, in the softness of its contours compared with the more rugged carving of the higher latitude; and this feature was seen to advantage in the course of the drive. The Conference party was very fortunate in having as guide Dr. D. R. Paterson, a Cardiff specialist, who is also an antiquarian of considerable learning; under his guidance the history of the Castle was made clear in sufficient detail. The applause with which a vote of thanks, felicitously proposed by the chairman and seconded by the president, was carried was an accurate indication of the gratitude of the visitors. Not less hearty was the reception of a resolution thanking the Marquis of Bute and Captain Williams, his agent, for the privilege of wandering about this interesting relic and for the sumptuous tea provided. Before leaving, the company heard a selection of songs from the male choir, which sang at Tuesday's evening banquet, an extra "turn" much appreciated.

The Conference ball, held on Wednesday evening in the assembly room of the City Hall, was a little late in getting under weigh, as the afternoon excursion had kept the members out of the city till nearly half-past seven; but it was none the less an enjoyable function. The apartment is a nobly spacious one, and is decorated with handsome paintings: the dancers thus found themselves in ideal surroundings, and at the time our report had to be written all was merry, to adapt a famous line of poetry, as a Conference ball.

WHO WERE THERE

The following is the official list of members and visitors attending the Conference:—

Adams, Miss E., London
Adams, F. W., London
Afleck, C. W., Chester
Anderson, Dr. Campbell,
Cardiff
Anderson, D., London
Anderson, Mrs., London
Anstis, Miss Rose, Rumney
Archer, R. M., Cardiff
Armitage, N. N., Leeds
Armitage, Mrs., Leeds
Ashworth, T., Liverpool
Ashworth, Mrs., Liverpool

Badger, S. S., Magherafelt
Badger, Mrs., Magherafelt
Badgett, T. J., Newport
Badgett, Mrs., Newport
Bagshaw, Harold, Oldham
Bagshaw, Mrs., Oldham
Bain, Miss Mary, Glasgow
Baldry, Rowland E., London
Baldry, Mrs., London
Bayles, Howard, London
Beardsley, W. J., Woodford
Green
Beardsley, Mrs., Woodford
Green
Beed, E. Trevor, Cardiff
Bell, Wm. G., Durham City
Bennett, R. R., Harrow-on-the-Hill
Bennett, Mrs., Harrow-on-the-Hill

Berry, Harry, Birmingham
Bethune, W. J., Inverness
Bethune, Mrs., Inverness
Birnie, James, Meols Hoylake
Boag, Miss M. G., Edinburgh
Borrowman, Miss A. T.,
London
Boyes, G. R., London
Boyes, Mrs., London
Boyes, Miss L. M., London
Brackenbury, W. R., Middles-
brough
Brewis, E. T., London
Brims, Donald, Cardiff
Brims, Mrs., Cardiff
Brindle, H., Manchester
Brindle, Mrs., Manchester
Brinson, Wm., Liverpool
Brinson, Mrs., Liverpool
Brooks, Leo M., Dulwich
Brooks, Mrs., Dulwich
Browne, E. Neville, Morden
Browne, Mrs., Morden
Browne, Frank, London
Browne, Mrs., London
Bryant, C. G., Aberdeen
Bull, B. A., West Bridgford
Bullions, J., Pelaw
Bullions, Mrs., Pelaw
Burgess, F. W., Brighton
Butler, Miss E. M., Cardiff

Carter, J. C., London
Carter, Mrs., London

Chalmers, J., Hounslow
Chalmers, Mrs., Hounslow
Chalmers, W., London
Chalmers, Mrs., London
Churcher, Dr. M. Foyle,
Rumney
Claremont, Miss, London
Clarke, Miss F., New Milton
Cleworth, John, Manchester
Connor, J. E., Newry
Coul, Dr. George, Leith
Coul, Mrs., Leith
Coul, Miss, Leith
Corfield, C. E., Barnet
Corfield, Mrs., Barnet
Craloner, F., Preston
Cross, Miss G. V., London
Crossley Holland, Dr. F. W.,
London
Coutts, Jas., Glasgow
Culbert, Hugh, Coatbridge
Culbert, W. S., Airdrie
Culbert, Mrs., Airdrie

Daniels, M. L., West Bridg-
ford
Davies, John, Tony-pandy
Davies, J. Malcolm, Cardiff
Davison, J. L., Manchester
Davison, Mrs., Manchester
Day, J. T., Cardiff
Day, Mrs., Cardiff
Deacon, W., Bridgwater
Deans, Harold, Sudbury

Desmond, Mr., London
Desmond, Mrs., London
Dobie, Miss, Birkenhead
Dobson, Jas., Hounslow
Dobson, Mrs., Hounslow
Dott, D. B., Musselburgh
Dott, Miss M. F., Musselburgh
Duck, W. G., Cardiff
Duff, Peter M., Glasgow
Duncan, Miss I. H., Dundee
Duncan, Miss Jeannette, Man-
chester
Dunn, W. R., Wolverhampton
Eason, Miss Edith, Cardiff
Eason, Miss Elsie, Cardiff
Eason, S. B., Cardiff
Eason, Mrs., Cardiff
Edwards, Evan D., Cardiff
Egerton, W. L., Portsmouth
Evans, A. A., Cardiff
Evans, D. H., Liverpool
Evans, Mrs., Liverpool
Evans, G. W., London
Evans, H. R., Bethesda
Evers, Norman, London

Ferriday, A. J., Liverpool
Ferriday, Mrs., Liverpool
Ferry, G. J. W., Cheadle
Hulme
Ferry, Mrs., Cheadle Hulme
Forbes, J., Eastbourne
Forbes, Mrs., Eastbourne
Forster, N. E., Newcastle

BRITISH PHARMACEUTICAL CONFERENCE 1930

Forster, W., Seaham Harbour
Fouracre, Mr., London
Francis, Alan, London
Francis, Jas. B., Wrexham
Franklin, J. W., Manchester
Franklin, Mrs., Manchester
Freke, Mrs., London
Furnivall, Mr., Cardiff
Furnivall, Miss, Cardiff
Fyffee, Miss Eliza, Dundee

Gamble, F. W., London
Gaze, W. C., London
Gilbert, J. S., Swansea
Gilbert, Mrs., Swansea
Giles, C. C., Newport
Giles, Mrs., Newport
Gilmour, Andrew B., Glasgow
Gilmour, John, Dunfermline
Goundry, R., Cardiff
Goundry, Mrs., Cardiff
Gower, John, Llanelly
Gray, W. J., London
Gray, Mrs., London
Gray, Miss, Dunstable
Greenish, Henry G., London
Gregory, C. K., Cheltenham
Gwillim, Mr., Brecon

Hagon, Miss, Cardiff
Hague, Miss Ida, Cardiff
Hague, John, Lincoln
Hague, Mrs., Lincoln
Hague, S. W., Cardiff
Hague, Mrs., Cardiff
Hallett, W. J., Bath
Hallett, Mrs., Bath
Hampshire, C. H., London
Hampton, Mrs., London
Hardy, Thos., Maryport
Hardy, Mrs., Maryport
Harris, A. J., Cardiff
Harris, Mrs., Cardiff
Harvey, Miss Frances, London
Hay, Wm. F., Aberdeen
Hayes, Miss G. N., London
Hemming, Fredk., Portsmouth
Hendy N. Ingram, Hillingden
Hill, E. W., Cardiff
Hill, Mrs., Cardiff
Hill, J. Rutherford, Edinburgh
Hills, F. W., London
Hines, F. Gladstone, York
Hobbs, H. A., Penarth
Hobbs, Mr., Penarth
Hodgkinson, Miss, London
Holloway, H. H., Birmingham
Hopkins, R. L., Barry
Hopkins, Mrs., Barry
Howard, D. Lloyd, Ilford
Howells, E. G., Cardiff
Howells, Mrs., Cardiff
Hughes, Martin S., Liverpool
Hughes, Mrs., Liverpool
Humphrey, John, Harrow
Humphrey, Mrs., Harrow
Hurlstone, A. F., Weybridge
Husband, H. H., Cardiff
Husband, Mrs., Cardiff

Irvine, Peter, London
Irvine, Mrs., London
Isherwood, Joseph E., Blackburn

Jackson, R. C., North Shields
Jackson, R. Ernest, North Shields
James, Percy, Cheltenham
James, Mrs., Cheltenham
Jenkins, A. H., London
Jenkins, Miss Amie, Cardiff
Jenkins, Geo., Cardiff
Jenkins, Mrs. J. D., Cardiff
Jenkins, J. Owen, Cardiff
Jenkins, H. W., Cardiff
Jenkins, Miss Peggy, Cardiff
Johnson, A. S., Cardiff
Johnson, Miss Mary, Cardiff
Jones, A. T., Liverpool
Jones, Mrs., Liverpool
Jones, A. Thornton, Cardiff
Jones, Dr. J. Bowen, Rumney
Jones, Mrs., Rumney
Jones, Edward, Cardiff
Jones, G., Chester
Jones, Jabez A., Cardiff
Jones, J. Lee, Cardiff
Jones, Mrs., Cardiff
Jones, T. L., London

Jones, Mrs., London
Jones, W. Miall, Aberystwyth
Jones, Mrs., Aberystwyth
Judd, J. N., Penarth
Judd, J. T. B., Penarth
Judge, J., Wakefield
Judge, Mrs., Wakefield

Kaye, Eric, Rumney
Keall, John, London
Keall, Mrs., London
Kirby, S. J., Bradford
Kirby, Mrs., Bradford
Kirkpatrick, D. L., Belfast
Kirkwood, Miss, Wallington

Lancaster, J., Leeds
Lancaster, Mrs. Leeds
Lawrence, W., Lichfield
Lea, Fred, Cardiff
Lewey, H., Westcliffe
Lewis, David, Manchester
Lewis, Miss Marion, Manchester
Lindsay, R. W., London
Lindsay, Miss S. Mabel, London
Linstead, H. N., London
Linstead, Mrs., London
Lockyer, J. C., London
Loxley, C. H., London
Loxley, Mrs., London
Loxley, E. G. T., Llandough
Loxley, Mrs., Llandough
Lucas, H., London
Lynch, Miss C. K., Hastings

McAllister, Miss M., Glasgow
McCall, Dr. David, Dundee
Mackenzie, D. G., Glasgow
Mackie, Henry B., Brighton
Mackie, Mrs., Brighton
McVitae, John B., Glasgow
Mallinson, G. A., London
Mann, C. W., Birmingham
Mann, Mrs., Birmingham
Marns, T., London
Marns, Mrs., London
Marris, G. W., Liverpool
Marshall, H. H., Birmingham
Marshall, Mrs., Birmingham
Martin, T. O., Gloucester
Melhuish, A. R., London
Melhuish, Mrs., London
Melville, Miss Eileen, Cardiff
Merrin, A. C., London
Merrin, Mrs., London
Miller, H., Cheltenham
Miller, Mrs., Cheltenham
Miller, Miss Joan, Cardiff
Milner, J., Greenwich
Milner, Mrs., Greenwich
Mogg, A. T., Cardiff
Morgan, Miss Gertrude, Cardiff
Morgan, H. Wm., Cardiff
Morley, H., Stockport
Morris, D., Llanelly
Muers, Miss J. W., London
Mumford, H. A., London
Mumford, H. G., London
Mumford, Mrs., London
Mumford, Miss Cherry, London
Murray, Jas., Cardiff
Murray, Mrs., Cardiff
Murray, Miss Maisie, Cardiff
Murray, Miss Marjorie, Cardiff

Neathercoat, E. T., Weybridge
Newey, F., Birmingham
Nix, R. H., London
Noblo, C. A., London
Noble, Mrs., London
Nutt, T. D., Hay

Peck, E. Saville, Cambridge
Phillips, D. Francis, Haverfordwest
Phillips, Sidney, Wolverhampton
Phillips, Mrs., Wolverhampton
Plowright, J., Brighton
Poole, E., Cardiff
Poole, Mrs., Cardiff
Poole, Jeffrey, Birmingham
Poole, Mrs., Birmingham
Potter, W., London
Potter, Mrs., London
Prior, J. S., Stamford
Pugh, Miss B. V., Cardiff

Purse, F., Leicester
Pym, C. H., Llandaff North
Pym, Mrs., Llandaff North

Rae, John, Liverpool
Reed, J., London
Rees, M. T., Corsham
Rees, Dr. T. R., Cardiff
Rees, Mrs., Cardiff
Reynolds, Joe, Mountain Ash
Reynolds, Mrs., Mountain Ash
Roberts, Arthur, Llandudno
Roberts, Miss Ivy, Manchester
Robinson, R., Cardiff
Robinson, Mrs., Cardiff
Rogers, Edward P. R., Stratford-on-Avon
Rowe, Miss, Gidea Park
Rowell, Philip F., Exmouth

Saunders, G. C., Rumney
Scholes, Wm. J., Manchester
Seaton, O. C., Grimsby
Seaton, Mrs., Grimsby
Shelton, Mrs. M. H., Cardiff
Shelton, Miss Ivy, Cardiff
Shepherd, Allan, London
Short, G. R. A., London
Simmons, E. H., Salford
Simpson, C., Aberdeen
Skinner, Herbert, London
Smith, A. Nutter, Nottingham
Smith, Miss Cora, Rumney
Smith, E. Lester, London
Smith, F., Birmingham
Smith, Mrs., Birmingham
Smith, Roderick, Stonaway
Stiles, P., Market Harborough
Stiles, Mrs., Market Harborough
Storey, F., Belfast
Storey, Mrs. F., Belfast
Surfleet, A. G., Hull
Surrett, Mrs., Hull
Swanston, W. E., London
Swanston, Mrs., London
Symonds, Mr., Ipswich
Symonds, Miss, Ipswich

Taylor, S., Derby
Taylor, W. S., Invervie
Taylor, Mrs., Invervie
Thomas, Dan, Cardiff

Thomas, Mrs., Cardiff
Thomas, H. W., Glasgow
Tibbett, H. G., London
Tickle, Miss Catherine, Cardiff
Titterton, Eric, Cambridge
Titterton, Mrs., Cambridge
Trick, W. B., New Barnet
Tucker, W. T., London
Tucker, Mrs., London
Turner, A. E., Bulwell
Turner, Mrs., Bulwell
Twivey, Arthur, Birmingham
Twivey, Sister Miriam, Cardiff
Tyler, A. T., London
Tyler, Mrs. A. T., Hove
Tyler, B., Redhill
Tyler, Miss M. V., Cardiff

Vernon, Lloyd, Cardiff

Wallis, T. E., London
Walters, Edwin, Manchester
Walters, J. T., London
Walters, Mrs., London
Ward, E. A., Cardiff
Ware, Alan H., Devonport
Waring, E. S., West Bridgeford
Warlow, Mrs. D. I., Bristol
Warlow, F. R., Bristol
Warlow, Miss M., Newcastle, Staffs.
Watkins, A., Greenwood, Maidenhead
Wells, F. G., London
White, J. A., Shipley
White, Mrs., Shipley
Wigley, W. Gwynne, Cardiff
Wilde, Miss, Birmingham
Williams, D. J., Bath
Williams, Mrs., Bath
Williams, K. E. N., Winchester
Williams, Miss M. B., Barry
Williams, W. R., Cardiff
Williams, Mrs., Cardiff
Wilson, F. E., Bradford
Wilson, Mrs., Bradford
Winch, Miss Hope, Sunderland
Winchester, C. P., Upminster
Woolfs, V. J., Margate
Woolfs, Mrs., Margate
Yong, A. E., Leicester

Summer Outings

South-West London Chemists at Hildenborough

ABOUT sixty members of the South-West London Chemists' Association and Branch of the Pharmaceutical Society attended a successful outing on July 9 to Hildenborough, Kent. A charabanc and a fleet of private cars left Clapham and proceeded by various



A HAPPY GROUP AT HILDENBOROUGH

routes, converging at "The Old Barn" teahouse. Tea was provided on arrival, and was followed by games in the grounds. Mr. T. Beech captained a cricket team of mixed sexes against Mr. F. G. Wells and his party. A later meal provided a welcome interlude. In the evening sports were the chief attraction. A prize was awarded to the winner and runner up in each event. The prizes were presented by the president (Miss A. T. Borrowman). Before leaving "The Old Barn" refreshments were served.

Trade Report

The prices given in this section are those obtained by importers or manufacturers for bulk quantities or original packages. To these prices various charges have to be added, whereby values are in many instances greatly augmented before wholesale dealers receive the goods into stock, after which much expense may be incurred in garbiling, packing, etc. Qualities of chemicals, drugs, essential and fixed oils, and many other commodities vary greatly, and higher prices than those here quoted are charged for selected qualities of natural products even in bulk quantities.

28 Essex Street, W.C.2, July 24

Views in trade circles about business prospects are still pessimistically inclined rather than hopeful, while the key to the present situation is the trend of the commodity markets. Fluctuations in produce this month have been more orderly than in June, although in some cases new low records have been touched this week. Seasonal influences are against markets, and their presence has thus aggravated the protracted depression. It is suggested, however, that commodity prices have now perhaps seen their worst; homeward shipping business this week has shown signs of recovery, particularly from the River Plate, and the time is possibly approaching when more hopeful views will prevail as to autumn trade prospects. Sugar has attracted somewhat more attention at the low prices, and rubber rallied slightly from a new low figure. Shellac is lower and still uncertain. In pharmaceutical chemicals quiet markets continue to be reported, with no price alterations of importance. Cream of tartar, citric and tartaric acids are unaltered and inclined to be weak. In spices, Zanzibar cloves and pimento are dearer. Pepper and African ginger are easier. Aromatic seeds are all unchanged. Interest in crude drugs has centred in the auctions this week. Privately, new crop cascara sagrada is dearer for shipment. Menthol is easier inclined. Among industrial chemicals, a slightly more active demand is noticeable, but the market, on the whole, is distinctly slow. Business in so-called vegetable oils continues quiet. Acid oils are slightly higher; palm oils show a slight increase, likewise linseed. American turpentine, Hankow wood, and castor oil are easier; cotton for soap-making is also easier.

Higher	Firmer	Easier	Lower
Cascara sagrada (c.i.f.)	Acid oils	Castor oil	Cassia fistula
Cloves (Zan.)	Gum acacia (Kordofan, c.i.f.)	Cotton oil (soapmaking)	Ginger (W. Afr.)
Linseed oil	Palm oils	Ipecacuanha	Glucose
Pimento (spot and c.i.f.)		Menthol (H.G.H.)	Peppermint oil (H.G.H.)
		Palm kernel oil	Rubber
		Turpentine	Sarsaparilla (grey Jam.)
		Wood oil	Shellac
			Turmeric
			Wax, Carnauba (spot)

Crude Drugs, etc.

ANTIMONY.—Chinese is steady in spite of the quiet demand, and spot parcels are held for £26 to £26 10s., delivered warehouse. C.i.f. terms for shipment stand at about £22 10s. Chinese crude on the spot remains nominal at about £21 10s. for 70 per cent. English high-grade refined is £46 to £46 10s., and good ordinary brands range down to £38. Demand lately for spot has been slightly more active. Chinese white oxide on the spot is about £30 10s. to £31.

BUCHU.—The exports from the Union of South Africa during February amounted to 10,052 lb. (£358), against 40,115 lb. (£1,429) in February 1929. During the two months ended February 28, 1930, the exports were 10,052 lb. (£358), against 60,865 lb. (£2,215) for the corresponding period of 1929.

CADMIUM.—The spot trade demand is still light, due to consumers being cautious about filling their requirements on account of the larger supplies accounted for lately, chiefly from Australia. Quotations for fair-sized lots range from

3s. 5d. to 3s. 7d. per lb. The output of the Consolidated Mining and Smelting Company of Canada for last year was 773,976 lb., against 491,894 lb. for 1928. Shipments were made chiefly to India and France, and it is understood that good quantities were consumed locally. World production for 1929 was estimated at, roughly, 2,000 tons, although complete returns are not yet available. No great reliance can be placed on these figures.

CAMPHOR (REFINED).—Japanese ¼-oz. tablets continue very scarce, a very limited quantity offering at 3s. 1½d. per lb. on the spot, and for delivery in about four weeks 2s. 10½d. is quoted. Slabs are offered at 2s. 4d. and flowers at 2s. 6d. spot.

CASCARA SAGRADA.—Old crop on the spot has been in more demand and sales have been made at from 66s. to 67s. per cwt. for three to five year old. For new crop, from 44s. to 46s. c.i.f. is quoted.

CLOVES.—Zanzibar are dearer on spot at 1s. 2d. per lb. To arrive, May-July shipment has been sold at 1s. 0½d., with sellers of June-July at 1s. 1½d., and August-October at 1s. 1½d. c.i.f.

The landings in London of Zanzibar during the week ended July 19 were nil and the deliveries 57, leaving a stock of 958, against 1,905 in 1929 and 6,666 bales in 1928. The landings in London from January 1 to July 19 have been 5,903, against 5,024 in 1929, and the deliveries 4,942, against 5,505 in 1929. Landings of Madagascar in London during the week ended July 19 were nil and the deliveries 95, leaving a stock of 3,201, against 465 in 1929. From January 1 to July 19 landings have been 4,824, against 848 in 1929, and the deliveries 1,636, against 2,928 in 1929.

COD-LIVER OIL.—Exports of medicinal cod-liver oil to the United States from Norway through the port of Bergen (which port accounts for the bulk of the exports) for the first quarter of 1930 amounted to 388,000 gallons, valued at \$311,000, against 411,000 gallons, valued at \$375,000, for the same period of the preceding year. Imports of cod-liver oil into the United States for the first four months of 1929 and 1930 were, respectively, 971,723 gallons, valued at \$928,544, and 1,064,147 gallons, valued at \$893,657.

CORN PRODUCTS, ETC.—Guaranteed water-white English glucose (corn syrup) is cheaper at 19s. per cwt. for July-October delivery ex works; American guaranteed water-white is also 19s. net for delivery until end of October, ex store. London. Dutch maize starch powder (cornflour) is 12s. 3d. per cwt. on the spot; American for July-October delivery is 12s. 3d. ex store, London. Pearl starch for July-October delivery is 11s. 9d. per cwt. ex store, London. Dutch maize starch crystals is 18s. on the spot, and American for July-October is 16s. per cwt. ex store, London. Dutch dextrin is quoted at 18s. to 22s. per cwt. on the spot as to quality. American canary for July-October delivery is 18s. 4½d.; white is 18s. 1½d. per cwt. net ex store, London, for July-October delivery. Dutch farina is 10s. 6d. per cwt. on the spot and 7s. 10½d. f.o.b. for prompt shipment, while new crop is 8s. Polish is 8s. 4½d. per cwt. c.i.f. London and 10s. on the spot.

DAMIANA LEAVES are quoted on the spot at 8½d. per lb.

ERGOT is quiet at from 10d. to 10½d. per lb. on the spot. Portuguese is about 1s. 3d., and Spanish 1s. 5d. on the spot.

GINGER.—West African is easier at 38s. per cwt., and to arrive 35s. c.i.f. is quoted. Jamaica is quoted at from 50s. to 55s. for small and at 75s. to 80s. for bold.

GUM ACACIA.—Kordofan is firmer, shippers asking 62s. 6d. per cwt. c.i.f. for cleaned for July-August shipment. Spot values are 67s. 6d. to 70s. for cleaned.

MAGNESIUM.—There is a steady demand reported by British makers and prices stand at 2s. 9d. to 3s. 3d. per lb. for ingots, small sticks and bars according to specification, and terms for ribbon stand at 13s. to 15s., for wire at 10s. 6d. to 12s. 6d., and powder at 5s. 6d. to 7s. 6d. per lb.

MENTHOL is easier inclined, with spot sellers of Kobayashi-Suzuki at from 14s. 5d. to 14s. 6d. per lb., and to arrive from 13s. 10½d. to 14s. c.i.f. is quoted.

MERCURY.—There is no fresh feature to report, but the tone has remained steady, with a quiet demand on the spot. Official quotations have remained at £22 2s. 6d. per bottle net according to quantity. So far as can be gathered, there is only little metal held by outside sellers. Terms for forward shipment, as quoted by the Combine, remain at £21 15s. net per bottle for at least 25 bottles.

PEPPER is easier on the spot at 9½d. per lb. for fair black Singapore, and at 6½d. c.i.f. for August-September shipment, which has been paid. Lampung is 9½d. spot; to arrive, sales include May-July shipment at 7½d. to 7d. to 7½d. c.i.f., with closing sellers at 7½d., and August-October at 6½d. to 6½d. c.i.f. Tellicherry on the spot is 10½d., and August-October shipment 88s. c.i.f. Alleppy on the spot is

10d., and August-October shipment 80s. c.i.f. White Muntok is easier at 10½d. spot. To arrive, the sales include May-July shipment at 9½d. to 9½d. to 9d., and August-October shipment at 8½d. o.i.f.

PIMENTO is firmer and dearer at 7½d. per lb. on the spot. For shipment, sales of July-August have been made at 62s. c.i.f., with buyers of August-October at 60s. per cwt. c.i.f.

PSYLLIUM SEED.—A cable from Assistant Commercial U.S. Attaché Greenup, Madrid, states that dealers in Madrid, Cadiz and Seville estimate the total 1930 Spanish psyllium crop, which has been seriously reduced on account of recent heavy rains, at between eight and twenty tons. Dealers in Barcelona and Malaga offer no estimates. The wholesale price at warehouse quoted in Barcelona, Malaga and Cadiz is five pesetas per kilo, subject to availability. Madrid and Seville not quoting. Exports of psyllium seed from Spain to the United States through the port of Seville, which along with Malaga accounts for the bulk of the trade, amounted to only 19,212 lb. for the first quarter of 1930, against 32,536 lb. for the corresponding period of 1929, according to Vice-Consul Gerald Keith. The value was \$5,300, against \$6,600, or a decrease of only 20 per cent. in value, against 41 per cent. in quantity. Consul J. S. Calvert, Marseilles, reports that the declared exports to the United States of psyllium (flax) seed from France through the port of Marseilles, which accounts for the bulk of the trade, during the March quarter of 1930 amounted to 441,000 lb., valued at \$110,110, against 455,500 lb., valued at \$60,100, for a similar period in 1929. Thus it is noted that while there was a decrease of approximately only 14,000 lb., the value nearly doubled.

ROSE PETALS.—French petals of the new crop are offered at 3s. per lb. c.i.f. to come forward.

RUBBER has further declined ¼d. per lb., and at one time spot was done down to the further low record of 5½d. per lb. The further decline was mainly due to disappointment at the reported result of the meeting of Dutch rubber producers, called to consider the restriction proposal and recommendations of the leading British and Dutch growers. As the result arrived at was more or less negative, it is feared generally that whatever scheme is decided upon will only be supported by a portion of the producers. In view of the continual fall in price, combined with the increase in stocks in all countries, it is fully recognised that some definite line of action will have to be decided upon to prevent a further debacle. Arrivals last week totalled 1,478 tons, whilst deliveries were 1,165 tons, showing a further increase in the stocks of 313 tons. The London stock now stands at 80,814 tons, against 30,790 tons at the corresponding period last year. The Liverpool stock now stands at 28,126 tons. Quotations (Wednesday, 5 p.m.): No. 1 standard ribbed smoked sheet, spot and August, 5½d.; September, 5½d.; October-December, 5½d.; January-March, 5½d. per lb.

SEEDS.—ANISE.—Spanish is 57s. 6d. and Russian 30s. 6d. per cwt. on the spot. CANARY.—Market is quiet; Mazagan on the spot is 27s.; Tangier is offered at 26s. and Morocco (f.a.q. 4 per cent.) 25s. on the spot. LINSEED is neglected. Mazagan is 25s. and Morocco 24s. on the spot. CUMIN.—Malta is 70s. for sifted and 65s. for fair average quality. Morocco on spot is quiet at 54s. FENUGREEK.—There is now very little to be had on spot at 18s. For shipment 14s. 9d. c.i.f. is quoted. CORIANDER.—Business has been done at 7s. 6d., and for shipment at 8s. 3d. per cwt. c.i.f. CARAWAY.—Dutch on spot is 34s. 6d. DILL.—Indian (11 per cent.) is quiet and unchanged at 21s. 6d. on the spot; very little remaining on spot. MUSTARD.—English is quoted at 26s. to 35s. per cwt. according to quality. N'YOUTI on the spot is quoted at 12s. per cwt.

SENEGA is unaltered at 2s. 2d. per lb. on the spot, and for shipment 11s. 11d. c.i.f. is quoted.

SHELLAC is lower at 100s. per cwt. for usual standard TN orange; fine orange is 115s. to 215s.; pure button 132s. 6d., and AC cakey 115s. To arrive, sellers of July-August shipment quote 79s. c.i.f. and September-October at 80s. c.i.f., with previous sales of October shipment at 85s. c.i.f. Sales for delivery include August at 91s. to 85s., October at 94s. to 86s. 6d., and December at 96s. to 96s. 6d. to 90s.

TONKA BEANS.—Fair frosted Angostura are quoted at from 5s. to 5s. 6d. per lb. on the spot; frosted Para at 1s. to 1s. 2d., and foxy at 10d. per lb.

WAX (VEGETABLE).—Carnauba is quiet. Fatty grey is 95s. per cwt. on the spot, and for July-August shipment 87s. 6d. c.i.f. is quoted; chalky grey is 95s. spot and 83s. c.i.f. Primera is 130s. spot and 117s. 6d. c.i.f. Mediana is 125s. spot and 115s. c.i.f. nominal.

WORMSEED.—Genuine quality (2 per cent. santonin) is quoted at 12s. 6d. per lb. c.i.f.

Essential Oils

LITTLE change is shown in prices. Bergamot, Sicilian orange and lemon show an easier tendency. Bourbon geranium is dearer on the spot. Peppermint, spearmint and wormseed are weak.

ANISE (STAR) is unchanged. "Red Ship" brand in leads is quoted at 5s. and in tins at 4s. per lb. To arrive, 3s. c.i.f. is quoted in leads, 2s. 11d. in tins, and 2s. 10d. in drums.

BERGAMOT is easier at from 9s. to 9s. 6d. c.i.f. On the spot, 9s. 6d. to 9s. 9d. per lb. is quoted, according to seller.

CASSIA is unchanged at 3s. 9d. per lb. spot, and to arrive at 3s. 1½d. c.i.f.

CINNAMON LEAF is quoted at 4s. 8d. per lb. spot, and forward 3s. 10½d. to 4s. c.i.f., according to quantity.

CITRONELLA.—Java is steady at 2s. 3½d. c.i.f. and 2s. 4½d. per lb. spot. Ceylon is 2s. 2½d. spot and 1s. 9½d. c.i.f.

GERANIUM.—Bourbon is extremely scarce on the spot and holders now ask from 17s. 6d. to 18s. per lb. Algerian is unchanged at 16s. 6d. spot.

GINGERGRASS is quoted at 7s. 6d. per lb. spot.

JUNIPER BERRY is quoted unchanged at 5s. per lb. spot.

LAVENDER.—French 38-40 per cent. is quoted at from 10s. to 10s. 6d. per lb. spot.

LEMON is unchanged, with easier tendency at the moment. Hand-pressed 4 per cent. citral is quoted at 4s. 3d. per lb. spot and 3s. 11d. c.i.f. Machine-made is 3s. 11d. spot and 3s. 7d. c.i.f. Prices vary according to citral content.

Estimates of Italian production of citrus oils for the past three seasons are given below:—

	Kilos 1927-28	Kilos 1928-29	Kilos 1929-30
Lemon	670,000	450,000	1,045,000
Bergamot	170,000	81,000	150,000
Sweet orange ..	136,000	136,000	114,000

ORANGE is inclined to be easier. Sicilian sweet is offered at 8s. 9d. to 9s. c.i.f. Bitter is the same price. On the spot about 9s. 6d. is quoted.

PALMAROSA is quoted at 9s. 6d. per lb. on the spot.

PEPPERMINT.—Japanese demethylolised is in little demand at from 4s. 8d. to 4s. 9d. per lb. on the spot; to arrive, from 4s. 7½d. to 4s. 9d. c.i.f. is quoted. A feature is that during the past month about 120 cases have been shipped from London to New York from spot and afloat oil. American natural tin oil is quoted at from 12s. to 12s. 6d. per lb. on the spot. H.G.H. on the spot is 16s. 6d., and for September delivery 15s. 6d. c.i.f. is quoted.

ROSE.—Before the Bulgarian rose crop was harvested the plants were attacked by the Agrillus grub, and, according to an important distiller, it will take two or three years before the pest is eradicated. Prices and market are firm, and it is not thought that values will go down before the next crop. On the spot "own distilled" is quoted at from 106s. to 110s., according to quantity, and "peasant distilled" at from 45s. to 65s., as to brand.

According to the official statistics published by the General-Direction of Statistics, Sofia, exports of Bulgarian otto of rose during March 1930 amounted to 22 kilos, valued at 2,578,000 leva, compared with 118 kilos, valued at 9,014,000 leva, for the same month of 1929. For the January-March period of the present year exports have amounted to 208 kilos, valued at 23,176,000 leva, compared with 174 kilos, valued at 13,234,000 leva, for the January-March period of 1929.

Exports during April 1930 amounted to 96 kilos, valued at 10,613,000 leva, compared with 79 kilos, valued at 6,038,000 leva, for the same month of 1929. In the January-April period of 1930 exports have been 304 kilos, valued at 33,789,000 leva, against 253 kilos, valued at 19,272,000 leva, in 1929.

Exports of otto of rose from Bulgaria during May 1930 amounted to 11 kilos, valued at 1,273,000 leva, against 22 kilos, valued at 2,160,000 leva, in 1929. Total exports from January to May have amounted to 315 kilos, valued at 35,063,000 leva, against 275 kilos, valued at 21,432,000 leva, in 1929.

SPEARMINT on the spot is quoted at from 19s. 6d. to 20s. per lb. according to seller.

WORMSEED (CHENOPODIUM) is unchanged at from 11s. spot and upwards according to holder.

The following arrivals have taken place from the countries indicated during the period July 9 to July 15, inclusive: Aniso (Fr.) 7 cs., (Ger.) 2 pkg.; camphor (Jap.) 3 dm.; cassia (H.-K.) 45 cs.; citronella (Java) 4 dm.; eucalyptus (Sp.) 1 cs., (Aust.) 40 cs.; fennel (Sp.) 1 dm.; geranium (Fr.) 9 dm., 1 cs.; juniper (Ger.) 3 cs.; lavender (Sp.) 9 dm.; lemon (It.) 148 cs., (U.S.) 1 cs.; orange (It.) 4 cs.; patchouli (Sey.) 3 cs.; peppermint (U.S.) 1 dm.; rosemary (Sp.) 1 dm.; sandalwood (Ger.) 2 cs.; saffrairs (Sp.) 2 cs.; spike (Sp.) 1 dm.; vetivert (Fr.) 1 dm.; undescribed (Fr.) 6 cs., (It.) 31 cs.

The following arrivals have taken place from the countries indicated during the period July 16 to July 22

(inclusive): Almond (Fr.) 30 cs.; bergamot (U.S.) 4 cs., (It.) 4 cs.; cade (Sp.) 4 dm.; cananga (Java) 4 dm., (Neth.) 1 dm.; cassia (Ch.) 30 cs., (H.-K.) 10 cs., (Ger.) 10 cs.; citronella (Java) 8 dm., (Cey.) 13 dm., (Br. Ind.) 2 dm.; clove (Ger.) 12 cs.; geranium (Fr.) 3 dm. 2 cs.; juniper (Ger.) 3 cs.; lemon (It.) 29 cs., (Neth.) 1 cs.; mandarin (It.) 14 cs.; orange (It.) 126 cs.; patchouli (Str.) 13 cs.; peppermint (Jap.) 10 cs., (U.S.) 1 cs.; rose (Fr.) 1 cs., (Turk. Eur.) 1 cs.; rosemary (Sp.) 3 dm.; sandalwood (Aust.) 152 cs.; spike (Sp.) 3 dm.; wormseed (U.S.) 1 dm.; undescribed (U.S.) 15 cs., (Br. Ind.) 3 cs., (Fr.) 34 cs., (Neth.) 1 cs.

Pharmaceutical Chemicals, etc.

QUIET markets continue to be reported, with prices unchanged. Cream of tartar, citric and tartaric acids are unchanged and inclined to be weak.

ASPIRIN.—Prices are unchanged at from 2s. 9d. to 2s. 11d. per lb. as to quantity.

ACETANILIDE continues to be quoted on spot at 1s. 4½d. to 1s. 6d. per lb., as to quantity, for B.P. crystals and powder; market is dull.

BARBITONE is quiet on spot at 7s. to 7s. 6d. per lb. as to quantity.

BENZOIC ACID is steady and the demand is fair: quantities, ex works, 1s. 11d.; spot parcels, about 2s. per lb. ex store.

CALCIUM LACTATE is steady at from 1s. 1½d. to 1s. 3d. per lb. as to quantity.

CHLORAL HYDRATE.—Duty-paid crystals are steady from home makers at 3s. 1d. to 3s. 3d. per lb. as to quantity; foreign has been reduced to 3s. 3d. per lb. for cwt. lots.

CITRIC ACID is unchanged, with sellers of foreign (B.P. crystals) at 1s. 6½d. per lb., less 5 per cent. English makers quote 1s. 6½d. per lb., less 5 per cent.

CREAM OF TARTAR is unsteady, with sellers of foreign 99 to 100 per cent. powder at from 89s. to 90s. per cwt. ex wharf, London, less 2½ per cent. There are sellers of English at 90s. per cwt., less 2½ per cent., carriage paid. English makers quote 90s. 6d., less 2½ per cent.

CREOSOTE (B.P.) remains slow, with dealers quoting at about 1s. 8d. to 1s. 9d. per lb. as to quantity.

CREOSOTE CARBONATE is unchanged on a dull market: spot, about 6s. 9d. to 6s. 3d. per lb. as to quantity.

GUAIACOL CARBONATE is of little interest: spot is quoted at about 4s. 4d. to 4s. 8d. per lb. as to quantity.

HEXAMINE is steady at about 1s. 10½d. to 1s. 11½d. per lb. as to quantity; business has been moderate.

HYDROQUINONE is steady, with a fair flow of business: quoted from 3s. 7½d. to 4s. 5d. per lb. as to quantity.

LACTIC ACID remains at the controlled rates of 1s. 11d. to 2s. per lb. as to quantity and packing; some second-hand parcels are at lower rates.

METHYL SALICYLATE is steady at from 1s. 3d. to 1s. 5d. per lb. according to quantity, although there is some indication that cheap Continental material is in evidence.

PARAFORMALDEHYDE is in fair demand on a competitive market: 100 per cent. powder, 1s. 6½d. to 1s. 7d. per lb.

PARALDEHYDE remains quiet: quoted from 1s. 1d. to 1s. 3d. per lb. as to quantity and packing.

PHENACETIN.—Sales are of moderate dimensions, while quoted prices are rather easy: spot, 3s. 8d. to 3s. 11d. per lb.

PHENAZONE is unchanged on quotation at 6s. 11d. to 7s. 3½d. per lb. as to quantity, and is easy at these rates.

PHENOLPHTHALEIN is unchanged at from 5s. 11d. to 6s. 1½d. per lb. as to quantity.

RESORCIN is unchanged on a slow market: quoted from 2s. 11d. to 3s. 2d. per lb. as to quantity.

SALICYLIC ACID (B.P.) is steady at home makers' prices of 1s. 5d. to 1s. 8d. per lb. as to quantity.

SULPHONAL continues to be quoted on a dull and easy market at 10s. 1d. to 11s. 2d. per lb. as to quantity.

TANNIC ACID (B.P. *leviss*) is unchanged, with the demand limited: quoted from 2s. 8d. for quantities in kegs up to 3s. per lb. for small parcels.

TARTARIC ACID.—Dealers report a shade more inquiry, with foreign (B.P. crystals) offering on the spot at 1s. 0½d. per lb., less 5 per cent. English makers quote 1s. 1d. per lb., less 5 per cent.

VANILLIN from clove oil is quoted at from 13s. 6d. to 14s. 6d. per lb.; guaiacol material is offered at 12s. 6d.

Industrial Chemicals, etc.

London, July 23.

PRICES continue to hold at unchanged rates, and the market, although slightly more active, is still distinctly slow on the whole.

ARSENIC.—Business is still quiet and purchases are confined to small lots on the basis of £15 15s. f.o.r. mines for Cornish white 99 per cent. A fair quantity has arrived on this side lately from Japan. Mexican high-grade is obtainable at about £16 15s. c.i.f. Liverpool.

EPSOM SALT is steady at about £4 5s. per ton for commercial quality, in single bags, ex store.

FORMALDEHYDE is unsettled on a competitive market: 40 per cent. by volume is quoted in the region of £31 per ton in casks, ex store; less for large quantities.

IODINE.—Large stocks of crude iodine are reported in Chile by the United States Vice-Consul at Antofagasta. One local oficina is said to have enough iodine on hand to supply the entire world for a year. Exports of iodine from Chile to all countries through the port of Antofagasta, which accounts for a large part of the exports, were 80 metric tons, 14 tons of which went to the United States, for the first quarter of 1930, against 78 metric tons for the three months ending December 31, 1929.

ISOPROPYL ALCOHOL continues to move in small lots, with prices for reliable quality holding at about 11s. to 12s. per gallon, in drums, carriage paid.

LITHOPONE is steady but quiet: 30 per cent. Continental red seal, £19 10s. per ton in casks, ex store; slightly less for contracts.

OXALIC ACID is unchanged, while business is restricted to smallish quantities: £32 per ton and 32s. 6d. per cwt., ex store.

POTASH CAUSTIC is slow of sale, but Convention prices are maintained: 88 to 92 per cent. solid, £29 10s. to £34 10s. per ton, in drums, ex store; 30s. per ton less c.i.f.

POTASSIUM CARBONATE is meeting with a poor demand and dealers' prices are easy as quoted: 90 to 92 per cent., £23 10s. to £24; 96 to 98 per cent., £25 10s. per ton, in casks, ex store; less for contracts.

POTASSIUM CHLORATE shows no improvement in demand, business being in small lots only: quantities, £36 5s. per ton; spot parcels, from 3½d. per lb., ex store.

POTASSIUM PERMANGANATE is unchanged; business of size is lacking: quantities in two-cwt. drums, 5d.; small lots, 5½d.

POTASSIUM PRUSSATE is steady while business is limited: quantities, £63 10s. to £65 10s.; single casks, 7d.; small lots, 7½d. per lb., ex store.

SAL AMMONIAC is steady and business shows a slight improvement: dog-tooth crystals, £32; medium, £28; fine white crystals, £17 12s. 6d. per ton, in casks, ex store.

SELENIUM.—There is a fair demand and quotations are 7s. 8d. to 7s. 9d. per lb. for high-grade black powder, delivered ex warehouse, Liverpool.

SODIUM HYPOSULPHITE is moving off fairly well: dealers quote pea crystals in one-cwt. kegs at about £15 per ton; commercial quality in casks, £9 10s. per ton ex store, and less for good quantities. Makers' price for pure crystals to home consumers on contract, £15 per ton, carriage paid to buyer's station.

SULPHUR.—There is a moderate demand and American crude 99.9 per cent. ranges from £5 12s. 6d. to £5 17s. 6d. c.i.f., while Sicilian flowers are £11 5s., refined ground £10, and roll £8 15s. c.i.f. to arrive.

COAL-TAR PRODUCTS, ETC.—Prices are maintained generally, while the slight improvement in demand continues to be noted in some directions. ANILINE OIL is unchanged and steady at 8½d. per lb., packages extra, carriage paid. ANILINE SALT is unaltered at 8½d. per lb., packages extra, carriage paid. BETANAPHTHOL continues steady at about 9d. per lb., carriage paid, with the market quiet. CARBOLIC ACID crystals are unchanged, with the demand anything but active; most of the second-hand parcels appear to have been cleared. Makers' quoted prices are holding at 7d. to 7½d. per lb., carriage paid or f.o.b., in drums with overcasks for 39° to 40° C. crystals. Crude carbolic, 60's, 2s. 2d. to 2s. 3d. per gallon, naked at works. CREOSOTE OIL continues to be quoted for export at 4½d. to 4¾d. per gallon, in bulk quantities, f.o.b.; home trade is in the region of 4d. per gallon ex works. CRESYLIC ACID remains in small demand, with prices unchanged: pale, 97 to 99 per cent., 1s. 10½d. to 2s.; refined, 2s. 6d. to 2s. 7d.; dark, 95 per cent., 1s. 7d. per gallon. NAPHTHALENE continues unchanged on a quiet market: flakes and balls, £14 12s. 6d. to £14 15s. per ton, in cases, ex wharf. METHYL ALCOHOL continues to be quoted on spot at about £42 per ton in drums; cheaper prices for quantities.

PYRIDINE is quoted at 3s. 9d. to 4s. per gallon f.o.b., with the demand small. TOLUOL is quiet and unchanged: commercial 90's, 1s. 10d.; pure, 2s. 2d. per gallon ex works. XYLOL is unchanged, with the market dull: commercial, 1s. 10d.; pure, about 2s. 1d. to 2s. 2d. per gallon ex works. PITCH is unchanged at the nominal quotation of 47s. 6d. per ton f.o.b. East Coast, with occasional inquiry for next season.

Fixed Oils, etc.

THE markets continue to be reported quiet in some instances. Acid oils are slightly dearer. Palm oils are steady and show a slight increase on the week. Turpentine is still unsteady and is slightly easier. ACID OILS are slow, with prices slightly dearer: coconut and/or palm kernel, 30s.; groundnut, 27s.; soya, 22s. spot. CASTOR continues quiet, with prices easier: pharmaceutical, 44s.; first pressings, 39s.; second pressings, 37s. per cwt., in barrels, in not less than one-ton lots. COCONUT is unchanged and quiet: deodorised, spot, 39s. 3d.; Ceylon, 29s. 6d. c.i.f. COTTON.—Rather quiet markets continue, with soapmaking slightly easier: deodorised, 36s. 6d.; common edible, 34s. 6d.; soapmaking, 30s. 6d.; crude, 29s. 6d. spot. GROUNDNUT.—Prices are unchanged on a dull market: deodorised, spot, 39s. 3d.; crude Oriental, 33s. c.i.f. PALM KERNEL.—Quiet markets continue, with the value for crude slightly easier: deodorised, 38s. 3d.; crude, 30s. 6d. spot. PALM.—A steady tone has been maintained throughout and prices show a slight improvement on the week: Lagos, 24s.; softs, 23s. 9d.; mediums, 24s. 3d.; hard, 25s.; bleached, 26s. 9d. spot. RAPE is unchanged with the market dull: refined, 38s.; crude, 36s. 6d. spot. SOYA.—Business continues quiet: deodorised, 35s.; crude, 27s. 9d. spot. LINSEED (raw, naked).—The market shows a slight advance on the week, with the better positions for forward delivery continuing: on spot, 35s.; August, 31s. 3d.; September-December, 30s. 4½d.; January-April, 28s. 10½d. Boiled oil, on spot, 40s. 3d. TURPENTINE.—There have been rather sharp fluctuations in the American market covering about 2c. per gallon, but this has not been reflected in any important fluctuations on this side. Fluctuations were rather narrow, with a generally dull feeling, closing lower at 35s. 6d. spot; August, 35s. 6d.; September-December, 36s. 3d. London deliveries for last week were 1,906 barrels, making a total since January 1 of 56,837 barrels, which compares with 55,799 barrels for the same period last year. Stocks were returned at 11,587 barrels against 11,181 barrels a year previous. Including the quantities landing, the London visible supply made up at 15,587 barrels, against 14,931 barrels a year before for January-April. RESIN.—Business has been very restricted, but the market has displayed a steadier tone, in line with somewhat better American advices. C.i.f. terms for shipment for American were as follows: B/D 12s. to 12s. 3d., E/I 12s. 6d., K/M 12s. 7½d. to 12s. 9d., N 13s. 9d., W/G 14s. 6d., and W/W 16s. 6d. per cwt. French was more firmly held, with W/G quoted at 12s. 10½d. and W/W 13s. c.i.f. for near shipment. WOOD.—Hankow in barrels is dull and easier at 49s. per cwt. on the spot.

LUBRICATING, MINERAL, BURNING OILS, ETC.—Business is still very limited in volume. Lubricating oils continue unsteady and easy as quoted. BENZOL continues in good demand with the market steady: standard motor 90's, country, 1s. 5d. to 1s. 5½d.; London, 1s. 6½d. to 1s. 7d. per gallon, ex works, in tank wagons. FUEL OIL is unchanged with the market quiet: 950 gravity, £3 5s.; 890 gravity, £3 17s. 6d. per ton ex tank; cheaper forward. PARAFFIN OILS are a firm market and unchanged: American standard white, 1s.; water-white, 1s. 1d. per gallon, barrels free, ex wharf. PARAFFIN WAX and SCALE.—Wax is quiet and easy at from 1½d. to 5d. per lb. according to melting point, in bags; scale for shipment is unchanged at about £12 2s. 6d. per ton, e.i.f. port. WHITE OILS are dull and unchanged generally: special No. 1, £24 7s. 6d.; No. 1, £23 7s. 6d.; No. 3 half-white, £20 7s. 6d.; No. 4 half-white, £18 7s. 6d. per ton, drums and barrels free, ex wharf. SOLVENT NAPHTHAS.—90 to 160 continue steady at 1s. 2d. per gallon, naked at works; heavy 90 to 190 are unchanged and dull at 1s. 1d. per gallon naked at works. PETROLEUM JELLIES are still quiet and unchanged: white to snow-white, £36 10s. to £46 10s., amber and yellow, £18 10s. to £22; dark stiff green, £11 5s. per ton, barrels free, ex wharf. LUBRICATING OILS are easy, with the market dull and unsteady: spot, pales, £9 12s. 6d. to £21; reds, £11 to £21; dark cylinders, £12 to £30; filtered cylinders, £21 to £31 10s. per ton, less 2½ per cent. SOLUBLE OILS and CUTTING COMPOUNDS continue to be quoted at £20 to £23 per ton net. No. 1 RUSSIAN OIL is offered on spot at £14 7s. 6d. per ton, less 2½ per cent., barrels free, ex wharf.

London Drug Auctions

Commercial Sale Rooms,
Mining Lane, E.C.3.
July 24

THE drug auction to-day largely consisted of a recital of prices asked for the goods and very few bids were forthcoming, while there was a very poor attendance of buyers, owing to the holidays. Small sales of Cape aloes and buchu were made at about steady prices. Cardamoms failed to sell, and of dragon's blood the quantity offered was excessive; fine reboiled was held for previous high prices; gamboge was more plentiful but neglected. A good assortment of honey offered, and although there were practically no limits there were no public buyers. Ipecacuanha has an easy undertone, no interest being shown. Small sales of rhubarb had been made privately, but good quality was absent. Grey Jamaica sarsaparilla was in large supply, and although offered at a reduction of 6d. per lb. on the previous auction prices, failed to sell. Senna and beeswax were without interest. The following table shows the quantity of goods offered and sold, the asterisk denoting private sales:—

	Offered	Sold		Offered	Sold
Aloes—			Honey—		
Cape ..	61 ..	8	Guatemala ..	119 ..	0
Curaçao ..	52 ..	0	Jamaica ..	664 ..	5
Socotrine (kgs.)	15 ..	0	Mexican ..	168 ..	0
Zanzibar (cs.)	3 ..	0	St. Lucia ..	106 ..	0
Ambergris (pots)	5 ..	0	San Domingo ..	125 ..	0
Amatto seed ..	15 ..	0	Trinidad ..	6 ..	0
Balsam Peru ..	5 ..	0	West Indian ..	22 ..	0
Balsam tolu ..	21 ..	0	Ipecacuanha—		
Benzoil—			Matto Grosso ..	10 ..	1
Palembang ..	6 ..	0	Kho ..	5 ..	0
Salon ..	9 ..	0	Kola ..	35 ..	12
Siam ..	13 ..	0	Lemon juice ..	7 ..	0
Sumatra ..	158 ..	9	Lime juice ..	2 ..	0
Buchu ..	34 ..	6	Myrrh ..	57 ..	0
Calumba ..	180 ..	0	Olibanum ..	180 ..	3
Camphor (Jp. tabs., cs.)	4 ..	0	Orange peel ..	41 ..	0
Camphor oil (cs.)	4 ..	0	Orris (Mor.) ..	25 ..	0
Capsicums ..	112 ..	0	Palmarosa oil (pots)	7 ..	0
Cardamoms ..	146 ..	3	Patchouli oil ..	5 ..	0
Cardamoms, green	10 ..	0	Pepper (Afr.) ..	20 ..	0
Cascarilla ..	40 ..	2*	Peppermint oil		
Cashew nuts ..	128 ..	0	(Ch., cs.)	2 ..	2*
Cassia fistula ..	31 ..	0	Peppermint oil		
Chaulmoogra oil ..	10 ..	1*	(Jp. dement) ..	5 ..	0
Chiretta ..	9 ..	9*	Petitgrain oil ..	2 ..	0
Cochineal ..	5 ..	0	Quince seed ..	1 ..	0
Colocyath and pulp	22 ..	0	Rhubarb (Ch.) ..	109 ..	5*
Cumin seed (sifts)	245 ..	0	Sandarac ..	20 ..	0
Cuscut ..	32 ..	0	Sarsaparilla—		
Cuttle fish bone ..	127 ..	0	Grey Jamaica ..	65 ..	0
Dragon's blood ..	101 ..	0	Honduras ..	19 ..	0
Hyabole (pkgs.)	8 ..	0	Mexican ..	10 ..	0
Elemi ..	10 ..	0	Native Jam. ..	11 ..	0
Ephedra (herb) ..	3 ..	0	Senega ..	4 ..	0
Ergot ..	31 ..	0	Senna and pods—		
Eucalyptus oil ..	74 ..	0	Alex. ..	108 ..	0
Euphorbium ..	10 ..	0	Tinnevely ..	194 ..	16
Galbanum ..	8 ..	0	Soy (Ch.) ..	5 ..	0
Galls ..	18 ..	0	Strophanthus ..	22 ..	0
Gamboge ..	24 ..	0	Stryax ..	25 ..	0
Gingergrass oil (pots)	4 ..	0	Tamarinds (W.I.)	10 ..	0
Guaiacum ..	18 ..	4	Tonka beans ..	27 ..	0
Gum acacia ..	170 ..	0	Tragacanth ..	61 ..	0
Gum Ghatti ..	15 ..	0	Turneric ..	147 ..	0
Gum Karaya ..	29 ..	0	Wax (bees)—		
Gum (Madagascar)	20 ..	0	Abyssinian ..	28 ..	0
Gurjun oil (cs.)	11 ..	0	Benguella ..	17 ..	0
Henna leaves ..	73 ..	0	Calcutta ..	14 ..	5*
Henna (powder) ..	20 ..	0	Conakry ..	90 ..	0
Honey—			East African ..	29 ..	0
Australian ..	10 ..	0	Jamaica ..	31 ..	0
Brazilian ..	83 ..	0	Madagascar ..	46 ..	0
Costa Rica ..	10 ..	0	Morocco ..	37 ..	0
Cuban ..	30 ..	0	Mozambique ..	20 ..	0
			Wax candelilla ..	3 ..	0
			Wax, carnauba ..	16 ..	0

Next Auction—September 25, 1930.

ALGES.—Cape was about steady, five cases of ordinary seconds selling at 33s. per cwt., and for three cases of similar quality 33s. was paid privately subsequent to the auction. Of Curaçao aloes 50 cases offered, and for fair bright part capey turning livery, a bid of 100s. was refused, the broker intimating that he would try 110s. A private bid of 122s. 6d. had been refused for two cases of fine Curaçao liver.

BENZOIN.—The only sale consisted of nine cases fair almondy Sumatra seconds, with old fracture at £6 5s. per cwt. Good fair almondy seconds was limited at £7 10s. to £8, and for good Palembang thirds a bid of 72s. 6d. was refused. Nine cases of Siam offered and bought in, comprising small to bold loose selected almonds at £29 10s. per cwt., small to medium ditto at £23 10s., pea and bean size, slightly blocky, at £25, which price has been paid privately.

BUCHU was about steady; good green round was withdrawn at 1s. 2d. per lb., and 1s. 1d. would be accepted. A single bale of fair green round sold at 1s., and for three bales of middling, slightly stalky round yellowish to bronzy from 10d. to 11d. was paid. Two bales of yellowish round sold at 9½d. per lb.

CALUMBA.—A parcel of 160 bags good bright small to extra bold washed offered, for which 35s. was wanted. Ordinary part sea-damaged to fair sorts was limited at from 25s. to 30s. per cwt.

CARDAMOMS were quite neglected. Good bold fine pale smooth Ceylon-Mysore were limited at 7s.; medium to bold sold at 5s. 3d., and medium at 4s. to 4s. 3d.; small pale at 2s. 9d. to 3s.; unclipped, brown and split and pickings, 2s. 3d. Three cases small pale sold at 3s. per lb. Ceylon seed was held at 4s. 3d. Sixty-two cases Mangalore were bought in at from 2s. 9d. to 5s. per lb.

CASCARILLA.—Nine bales of siftings were limited at from 1s. 9d. to 1s. 10d. per lb., and two bales of stringy quill sold at 3s. 10d.

CASHEW NUTS.—A parcel of 48 cases blanched was limited at from 65s. to 78s., and a lot of 80 cases natural at from 52s. 6d. to 57s. 6d. per cwt.

CASSIA FISTULA.—The three parcels offered consisted of part wormy and rattley pod, for which there was no demand. Privately, good sound quality is obtainable at 18s. per cwt.

CHIRETTA.—A lot of bales genuine Indian had been sold privately.

COCHINEAL.—A parcel of five bags silver-greys and greys was limited at 2s. 4d. per lb. Sales privately have been made at 2s. 3d.

DRAGON'S BLOOD was in excessive supply and quite neglected: fine reboiled Singapore lump was withdrawn at from £45 to £46 per cwt. For ordinary reboiled lump, slightly mixed of fair colour, £33 was wanted down to £30 as to quality. Common dark lump was limited at £25.

EPHEDRA HERB.—A lot of three bales Chinese Mahwang was offered at 3½d. per lb.

EUCALYPTUS OIL.—A lot of 80 cases was catalogued, 1s. 6d. per lb. being wanted for 80 per cent. and 1s. 2d. for 67 per cent. cineol.

GAMBOGE.—Several small parcels were offered, and for a lot of five cases of fair bright Siam pipe, part mixed with dark, and very blocky, £24 was wanted. For another lot of nine cases of good bright Siam pipe, mostly orange fracture, slightly blocky, £25 10s. was wanted, at which the broker intimated he was selling privately.

GUAIACUM.—The only lot disposed of was four barrels of ordinary part drossy lump at 7d. per lb. Good glassy lump in cases was held for 2s. 3d., a bid of 2s. being refused.

HONEY.—A good assortment of old and new crop honies offered from the usual sources, but there was no public demand, and practically all passed the hammer unsold. Valuations were probably down about 5s. on last auction. Fifty-four packages Jamaica sold previous to the auction, comprising 44 packages very nice pale liquid Jamaica, five packages pale liquid to setting, and five packages pale colour set. The following prices were asked for Jamaica: For pale set, 37s.; biscuit set, 36s.; light amber setting, 35s.; liquid amber, 33s.; dark amber set, 30s.

IPECACUANHA.—A single bale of dull grey, part mouldy, Matto Grosso sold at 9s. 3d. per lb. Ordinary dull lean to fair bright Matto Grosso was limited at from 10s. to 10s. 6d. Privately, Minas is quoted at 10s. 3d., and Cartagena at 10s. 6d. per lb.

KOLA was in small supply, 35 bags only being offered, of which 12 had been sold privately. For fair West Indian halves from 2d. to 3d. per lb. was asked.

OLIBANUM.—Three bags siftings sold at 42s. 6d. per cwt.

ORANGE PEEL was less freely offered, arrivals having fallen off, and parcels of old crop have now been cleared. The value of fair bright new machine-cut so-called Maltese peel is 8d. to 9d. per lb.

PETITGRAIN OIL.—Two cases El Boleador brand were limited at 5s. 3d. per lb.

QUINCE SEED.—For a bag of fair slightly blocky Cape 4s. 6d. per lb. was wanted.

RHUBARB.—There was no public business, a few sales being reported privately, including two cases of medium to bold round rough High dried at 1s. 4d. per lb. Medium to bold round Shensi, with half dull pinky and half grey and dark fracture was withdrawn at 5s., and pickings at 3s. per lb. Bold round Canton was held at 3s. and pickings at 1s. 9d., and High dried at from 1s. 1d. to 1s. 8d. per lb.

SARSAPARILLA.—Grey 'Jamaica' was in excessive supply and no business was done, although a decline of about 6d. per lb. would have been accepted, the selling price being 1s. 5d. to 1s. 6d. as to quality. Mexican was limited at 10d. per lb.

SENNA was neglected and easier. A few bales of fair medium clean greenish leaf sold at 3½d., and common to ordinary small yellowish went at from 2d. to 2½d. Fair Tinnevely pods were limited at 5d. down to 2½d. for dark. Of Alexandrian senna, 17 bales of good green siftings were bought in at 5d. Hand-picked pods were limited at 1s. 5d. to 4s. 6d. per lb. as to quality.

SOY.—For five Chinese (Sueloong brand) 2s. 3d. per gallon duty paid was asked.

STROPHANTHUS.—Eleven bags showing 100 per cent. Kombé (Holmes' certificate) were limited at 7s. per lb.

TURMERIC.—For a parcel of 60 bags fair Madras finger 27s. 6d. was wanted, while for 16 bags of Cochin split bulbs 25s. was asked.

WAX (BEES).—A lot of 33 packages bright yellow Conakry block sold at £6 per cwt., subject to seller's approval. Of Benguela, 17 packages were limited at from £5 17s. 6d., and for 23 packages Abyssinian block £6 was wanted. Sales of bleached Calcutta have been made privately at £3 15s. per cwt. Jamaica was held at £7 per cwt.

Gum Tragasol Imports to U.S.

TREASURY Decision 31798 describes gum tragasol as extracted from locust beans. The patents are owned by the Gum Tragasol Supply Co., Hooton, England. Imports of gum tragasol during 1927, 1928 and 1929 into the United States amounted to 1,496,000 lb., valued at \$54,900; 2,078,487 lb., valued at \$99,531; and 2,786,749 lb., valued at \$149,903, respectively.

English Herb Crops

W. J. Bush & Co., Ltd., write that they have paid a visit to the various plantations in and around Mitcham, and report as follows: **PEPPERMINT**: The crops of most of the plantations are looking very healthy, but at the time of our visit rain was badly wanted. Since then a fair amount of rain has fallen, and we look forward to a good crop. **LAVENDER** looks very well as far as bloom is concerned, but very little is grown in the districts we visited. **CHAMOMILES**: There is such a small quantity cultivated that it is really of little importance. The small quantity we did come across looked very well.

Value of Bulgarian Rose Oil Exports

ACCORDING to the official statistics of the General-Direction of Statistics, Bulgaria, the total value of otto of rose exported during the twelve months of 1929 was 266,804,000 leva, while the monthly exports were valued as follows:—

Month	Value, 1,000 leva	Month	Value, 1,000 leva
January	2,553	July	114,763
February	1,667	August	36,712
March	9,014	September	15,240
April	6,038	October	7,249
May	2,160	November	15,912
June	43,867	December	11,629

Japanese Camphor

THE Monopoly of the Taiwan Government General has announced a reduction in the price to be paid the Taiwan Camphor Manufacturing Co. for camphor supplied to the Bureau. The general situation both as regards the Monopoly Bureau and the company was carefully considered before this decision was reached, and it is confidently expected by high officials that the reduction in price will not affect the financial position of the company, as was claimed by the company during the early discussions. It is believed that the retrenchment steps taken by the company will more than offset the difference in revenue from the sale of camphor to the Bureau. The rates of reduction were officially published as of delivery to the Monopoly Bureau at Taihoku and are as follows:—

District	Crude camphor		Camphor oil		Hoshi oil	
	Yen	per picul	Yen	per picul	Yen	per picul
Shinchiku	5.00	—	1.00	—	1.00	—
Taichu	1.00	—	1.00	—	1.00	—
Tainan/Takao	1.00	—	3.00	—	—	—
Taito/Karenke	4.00	—	1.00	—	2.00	—
(Delivery to the Keelung office of the Monopoly Bureau)						
Taito/Karenke	—	—	1.00	—	2.00	—



Letters for this section should be written on one side of the paper only. Correspondents may adopt an assumed name for purposes of publication, but must in all cases furnish their real name and address to the Editor.

A Question of Policy

SIR,—A recent experience of mine in having to prepare a defence against a claim for damages through supplying a preparation for the hair which was alleged to have set up a serious skin irritation, leads me to urge upon my fellow-pharmacists the importance of being protected against such claims. Fortunately we were members of the Chemists' Defence Association, and, although the plaintiff's case was a weak one and we had a complete defence, and in all probability would have got a favourable verdict, yet our counsel was instructed to avoid if possible the publicity and annoyance which the trial would cause us and to settle the claim. This was done at the last moment. I cannot speak too highly of the grasp of the chemist's every-day problems which the directors of the C.D.A. have and of their policy in such matters. I am quite sure that if we had been insured with a lay insurance company the action would have been fought and a victory for us would have been a hollow one. Every chemist in business is open to such actions, and when full protection can be obtained for a very nominal annual subscription it is surely not worth the risk and worry to be without it.—Yours faithfully,

J. J. ROCHE

Dublin

A Small Concession

SIR,—The increase in the dispensing fee for D.D.A. preparations listed in the drug tariff when dispensed alone is a step in the right direction, for it has long been obvious that the extra responsibility and work entailed in dealing with these drugs warranted a higher fee than that paid for ordinary tariff drugs when prescribed alone. It may seem unkind to criticise a concession, but even now the fee is not great, and one may point out that while pil. morph. hyd. gr. $\frac{1}{4}$ are on the list, and from a 3d. fee now rise to 5d., yet a $\frac{1}{2}$ -gr. pill, which is not on the list and being dispensed extemporaneously earns 7d., has no increase for being a "dangerous" drug.—Yours faithfully,

CINQUE SOLDI (14/7).

An Unsatisfactory Case

SIR,—It must be a long time since your Legal Reports section contained a more unsatisfactory result than the one on page 66 of your issue of July 19, arising out of a case in which four chandlers at Bootle were summoned for selling liquid soap containing more than 3 per cent. of phenols. Owing to journalistic condensation it is not clear whether the defendants were summoned for selling a scheduled poison or for selling it not duly labelled. The point is, however, that in the first place, the clerk to the justices, presumably a person of some legal experience, asked: "What is the object in bringing these cases forward?"; and that, in the second place, the Bench, in dismissing the summonses, expressed the view that "the fault lay with an Order in Council rather than with the retailers of the soap." Surely the anomaly of the unpaid Bench and its loose ideas has never been more strikingly shown. Are we to infer that the wise men of Bootle have discovered an Order in Council relating to substances containing more than 3 per cent. of phenols? Or that such an Order, if discoverable, is *ultra vires* or is badly worded? So far as the report goes, it would appear that they have never heard of the Schedule to the Poisons and Pharmacy Act, 1908. The reading of this entertaining case sent me to Shakespeare's Justice Shallow ("How a good yoke of bullocks at Stamford fair?"), the eternal prototype of the muddle-headed

pundit in the judgment seat. And in laughing over Shallow I forgot, for the moment, the serious aspect of the Bootle case. I am, etc.,

MIDDLE TEMPLE (21/7).

Sales of Sample Sizes

SIR,—I notice that on page 19 of your issue dated July 19 Tokalon, Ltd., announce that Poudre Tokalon is now available as a sample size to retail at 6d. per box. Now, what I should like to know is: why has this line been on sale at the sixpenny stores for some weeks prior to being offered to the private trader?

Faithfully yours,

FAIR TRADER (18/7).

Difficulties in Photographic Business

SIR,—I agree with "Midlander" in his experience of supplying members of photographic societies with materials (*C. & D.*, July 12, p. 59). I endeavoured at one time to cultivate this trade, but soon found that I was looked on more as a convenience than as a source of supply, for the bulk of the inquiries were, as "Midlander" remarks, for odd sizes of papers, or special surfaces, out-of-the-way plates and sundries, and a typical habit of this sort of customer is to order one of these odd lines and to ask for two or three packets to be kept in stock so that there need be no waiting for supplies when the first packet is used up. I was caught out with a fair quantity of unsaleable stock by this means before I decided that I was too obliging, for I found that these customers invariably required another make next time, so that the one or two packets remained on hand, and I cannot remember such people ever being regular customers for the usual stock lines, although they must have been users of them fairly constantly. Whilst writing about this I also see in regard to the photographic side of our business that Selo, Ltd., which, by the way, the public will insist on calling "Sello," have circularised dealers regarding the unauthorised supply of films to other traders without permission. It seems as though we are to be faced with the old trouble which we had before the agreement with the Photographic Dealers' Association, and the same trouble which handicaps the Proprietary Articles Trade Association, caused by those men in the trade, who should know better, supplying goods to unauthorised dealers and thus fostering competition against themselves for the sake of snatching a quick, though small, profit. The most unfortunate part about it is that when one goes round in some other district than one's own and sees giant films and showcard displays one cannot know whether they are accredited dealers or whether someone in our own trade has been foolish enough to supply them with show material as well as goods.—Yours faithfully,

VECCHIO (12/8).

The Interpreter's Dilemma

SIR,—Regarding a prescription for "Tab. menthol gr. j." (*C. & D.*, July 12, p. 59), which strength was not made by the manufacturers indicated, I should like to say that I consider it only fair to other pharmacists to make a note on the script of what was actually supplied so that there might be uniformity in dispensing when the prescription is taken elsewhere, in this case as far apart as London and Scotland. Unfortunately for us some doctors are very haphazard in their specifications. It is not uncommon for scripts to be received ordering some preparation with the letters B.P. after it when it does not appear in that book, and, as your correspondent remarks, for preparations of one manufacturer to be initialled for a totally different house, but in these cases the dispenser can use his own judgment in giving what is obviously required. When we come to Insurance prescriptions, however, we have not the same latitude, as we are not supposed by the authorities to have any common sense, but to dispense what is written, and when this is impossible to refer to the prescriber, entailing delay to the customer, unwarranted trouble to the pharmacist, and generally friction with the doctor.—Yours faithfully,

GRANA (15/8).

Dispensing Notes and Difficulties

An Iodine Application

SIR.—Twice I have noticed in your columns the statement that iodine-acetic-ether pigments are immiscible. I have dispensed this prescription a hundred times, and I have never heard of it coming out. I have not kept any to see whether it separates, but offer my method for your interest.

Iodi	...	...	...	gr. v.
Æther. acetic. (acid free)	...	...	...	5ij.
Glycerin.	...	...	ad	5j.

Dissolve the iodine in acetic ether, place the glycerin in a mortar and add the solution a few drops at a time with considerable trituration.—Yours faithfully,

A. A. S. (21/3).

[The method suggested is a good one, but you must take our word for the keeping properties. Our samples a year old of the above, and also a mixture of acetic ether and glycerin, separate. It is easily mixed by shaking, but will always separate, as acetic ether is almost insoluble in glycerin. Iodine is soluble in both of the liquids, readily in acetic ether, and 1-65 in glycerin.]

Legal Queries

S. E. M. (17/6).—You will not be liable to pay income tax on the £1,000. As you have put it on deposit account with your bankers it will earn interest, and it is this income which will be subject to income tax. When making your return of income you will find that the form provides for any income received on bank deposits, etc., and you should show in this section the amount of the interest you have received during the year.

Cover (30/6).—Your proper course when supplying Part I poisons to a hospital where there is no qualified chemist is to ask for the signature of the medical officer on the order for these poisons for whose use they are intended. If this course is not practicable, then these sales can only take place by observing the conditions regulating any retail transaction, i.e., by making an entry in the Poison Book, which must be signed by the purchaser, in your case the matron or master of the institution.

F. S. D. (21/6).—Two of your labels render the articles liable to medicine-stamp duty owing to the inclusion of a proper name in the possessive case in the title, in addition to the statement "prepared only by," both of which imply a claim to a proprietary right in these preparations. With regard to the labels for Quinine and Iron Tonic, Indigestion and Stomach Mixture, and Cold and Influenza Cure, if you wish to avoid liability to medicine-stamp duty it will be necessary to comply with the new ruling of the Board of Customs and Excise (*C. & D.*, March 8, 1930, p. 300), which requires the disclosure of the complete formula on the label, and also on the wrapper or carton, together with the words "no proprietary rights are claimed in the preparation of this medicine."

H. J. S. (25/6) has at the back of his premises a small building with a glass roof which was erected thirty years ago and was formerly used as a studio. He wishes to remove the glass roof and substitute for it one of timber and roofing felt. Will he require the consent of the Borough Surveyor before having this work done? [It is probable that the consent of the local authority will be necessary; but in some districts the erection of or alterations to very small buildings of less than a stated cubic area is permitted without the previous consent of the local authority. "H. J. S." should go to the town hall and look at the bye-laws or make inquiries in the surveyor's office. If "H. J. S." makes the proposed change, he should also notify the fire insurance company and get the policy endorsed, if necessary.]

Miscellaneous Inquiries

When samples are sent particulars should be supplied to us as to their origin, what they are, what they are used for, and how. We do not undertake to analyse and report upon proprietary articles nor to publish supposed formulas for them.

W. T. T. (3/7).—VETERINARY RECIPE.—The first of the items in the recipe is *Ægyptiacum*, the formula for which is:—

Verdigris (in powder)	...	...	3i
Vinegar	...	...	5vij
Clarified honey	...	...	3xiv.

The last ingredient is solution of ammonia.

J. H. S. (10/7).—TINCT. IODO-GUAIACOL.—The following preparation figures under the title "Teinture d'iode guaiacolee" in the "Formulaire des Pharmaciens Français":—

Guaiacol	...	...	10 grams
Tincture of iodine (French Codex)	...	...	80 grams

The tincture of iodine to be used in compounding this preparation is that made official by the Supplement to the French Codex, 1922:—

Iodine	...	...	10 grams
Potassium iodide	...	...	4 grams
Alcohol (90 per cent.)	...	...	136 grams

W. H. (10/7).—MOTOR CAR POLISH.—The following composition has been found to yield excellent results in practice for polishing the fabric body of motor cars:—

Oleic acid	...	...	80.0
Liquid paraffin	...	...	250.0
Potassium hydroxide	...	...	15.0
Tragacanth	...	...	6.0
Water	...	...	to 1000.0

Mix the oleic acid with the paraffin and slowly add the potassium hydroxide, previously dissolved in 200.0 of water. Soak the tragacanth in 500 c.c. of water until fully absorbed, then heat to boiling, and when cool stir into the above emulsion.

E. H. G. (10/7).—COCCIDIOSIS IN TURKEYS.—This disease is due to an organism, highly contagious, affecting the intestines, and occasionally the liver or kidneys, of young birds. The fertilised eggs are passed out of the body and taken up by other birds. Practically there is no satisfactory cure, but all affected birds and those showing the least sign of the disease should be segregated or destroyed and the remaining poultry removed to new and clean runs and premises. Dig or turn over the affected ground and dress with lime, say 3-5 cwt. per acre, and keep all birds off for at least twelve months. Treatment is as follows:—Give one or one and a-half grains of sodium sulphocarbonate, dissolved in water and mixed thoroughly with the food, for every month of the animal's life; on the following day give 5-20 grains of magnesium sulphate in the same manner. All runs, boxes, etc., must be thoroughly disinfected.

Retrospect of Fifty Years Ago

Reprinted from
"The Chemist and Druggist," July 15, 1880

Hiera Picra

Rustic remarks that every wholesale druggist seems to supply a different article under the name of hiera picra, or pulv. aloes cum canella. Prices vary from 1s. 8d. to 3s. 6d. a lb. He has been accustomed to make it by adding 1 oz. powdered canella to 8 oz. Barbadoes aloes. The Dublin Pharmacopoeia of 1826 and the London of 1746 order 8 oz. of canella to 1 lb. of aloes, hepatic in the Dublin and Socotrine in the London. The Edinburgh Pharmacopoeia of 1732 ordered Socotrine aloes, 4oz.; Virginian snake root and lesser cardamom seeds, of each ½ oz.



[Commenced C. & D., July 5, 1924]

Solar Oil is a product of the shale oil industry. It is the fraction which distills over after the benzin and the kerosene: S.g., 0.860; flash point, by Abel test, 104.4. It is used in explosion engines as a high-grade fuel oil.

Sols.—The name "sol" was used by Graham to designate "colloidal solutions," often of substances which are generally considered insoluble, which did not pass through organic membranes. They were found to differ from true solutions in the readiness with which the dissolved substance was precipitated by mere traces of electrolytes. It is now known that any substance can be prepared in a colloidal condition in a suitable medium, and there are many substances which are known only in the colloidal condition, such as starch or proteins. The colloidal solution differs only from the ordinary suspension in the size of the particles, and consequently the much larger surface area in contact with the liquid. Sols are subdivided into "emulsoid" and "suspensoid" types. In the former, both disperse phase and dispersion medium are liquid; in the latter, the disperse phase is solid. In both kinds of sol the particles constituting the disperse phase are rendered visible by the ultramicroscope, in which they are seen as bright discs by means of the light they scatter. The instrument also enables the size of the particles to be determined, since it can be calculated from a knowledge of the volume of sol in the field of view, the concentration, and the number of particles visible. The particles in a sol are in constant motion, known as the Brownian movement, but the principal properties of sols are due to the fact that the particles are electrically charged. Emulsions are emulsoid sols, and usually there is a foreign body in the continuous phase, the purpose of which is to reduce the interfacial tension, so that a high concentration of disperse phase is possible. Emulsoids have a higher viscosity than that of either of the components and are not affected by low concentrations of electrolytes. Dilute emulsion sols can be obtained without an emulsifying agent, e.g., by pouring a dilute alcoholic solution of an oil into water, or by distilling an oil with water. Their dilution is of the order 1 in 1,000; they are not very stable and are sensitive to electrolytes. Some emulsoid sols, such as those of silicic acid, gelatin, agar-agar, etc., undergo under certain conditions a reversible change to a solid state without any loss of the liquid dispersion medium. With silicic acid this formation of a "gel" is induced by electrolytes; with gelatin and agar-agar sols it is induced by cooling and is strongly affected by electrolytes, being favoured by citrates, tartrates and sulphates, and retarded or prevented by a sufficient concentration of an iodide. In many emulsoids suspension of the particles is due to hydration as well as to their electric charge, and removal of either, singly, will not cause coagulation, while neutralisation of the charge and dehydration will, together, be effective. Thus an agar-agar sol is not precipitated by barium chloride alone or by strong alcohol, but both together produce immediate coagulation. From the therapeutic standpoint the more important sols are the suspensoids. The majority of these are negatively charged; important exceptions are furnished by certain dyes and by metallic hydroxides, notably ferric hydroxide sol (liquor ferri dialysatus), which are positively charged. The former are precipitated by the positive ions of electrolytes, the latter by the negative ions. This sensitivity to electrolytes is markedly

reduced by adding an emulsoid sol. Gelatin is one of the most efficient of these "protective colloids," and a minute proportion is sufficient to render a suspension sol stable in the presence of a considerable concentration of electrolyte. Other protective colloids are acacia, tragacanth, casein, dextrin, agar-agar and certain products of the hydrolysis of albumen; the various agents have different protective efficiencies for different sols, but one or more is always present in commercial colloidal solutions. Protective colloids appear to exert this effect by preventing coagulation of the particles, and this principle is applied in one method of preparing colloidal solutions.

Solubility is the extent to which any gas, liquid or solid will dissolve in, or mix with, any other substance under specified conditions of temperature and pressure. Under constant conditions the quantity of solute which dissolves in a solvent is constant. Gases are miscible in all proportions. The solubility of gases in liquids decreases with use of temperature, but is not affected by pressure—the volume dissolved at a definite temperature is constant for all pressures. The solubility of solids in liquids usually increases with rise of temperature. Exceptions are sodium sulphate (due to formation of the anhydrous form), ferrous sulphate and calcium salts which are less soluble in hot water; sodium chloride is practically equally soluble in hot and in cold water. Solubilities of solids in liquids are considerably influenced by other physical conditions besides temperature, notably the degree of fineness of the solute, and its crystalline form. Solubility may also be considerably affected by the presence of a third substance. Iodine, for example, is almost insoluble in water, but is readily soluble in concentrated solutions of potassium iodide. The solubility of a salt is diminished by adding another substance having a common ion.

Solution.—In a true solution the intermixture of solvent and solute is so complete that particles of solute are not visible even in the ultramicroscope. In most cases that constituent which is present in excess is termed the solvent, the other being the solute. Intermediate between suspensions and true solutions come the so-called "colloidal solutions" (see Sols), in which the particles of solute are visible in the ultramicroscope. Two theories have been proposed to account for the phenomena observed in solution. In the "hydrate" theory it is assumed that solute and solvent combine to form definite compounds. This will account, for example, for the thermal changes which frequently accompany solution. In the "ionic" theory the solute is considered to be split up into constituent ions which carry large electrical charges. The modern conception is a combination of these two views, and the ions are considered to be "hydrated" or associated with molecules of solvent. This association is not a true chemical combination, but is rather the result of electrical attractions. In general a solution of a substance occupies a volume larger than that of the solvent alone. In a few cases, however, notably aqueous solutions of caustic soda, the volume of the solution is less than that of the solvent. In addition to solutions in liquid solvents, solid solutions are also known; thus lead "dissolves" in silver. Gases may also dissolve in solids, a phenomenon generally known as "absorption" to distinguish it from surface condensation or "adsorption."

Solvent Naphtha is a mixture of xylene and toluene with higher homologues and small quantities of naphthalene and higher paraffins. It distils at 120°-160°; s.g. 0.862-0.870; flash point, 78°. As its name implies, it is used as a solvent for rubber, in the paint and varnish industry, and in the manufacture of grease and oil removers. It must be distinguished from "mineral naphtha," or simply "naphtha," which is a product of the petroleum industry.

Sorrel.—The plant to which the name is usually applied in this country is *Rumex acetosa*, N. O. Polygonaceae. It is a perennial herb not infrequent in soil containing some iron. Formerly it was cultivated in gardens for its leaves which were used like spinach, or

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in salads, and in the time of Henry VIII was held in great repute. But when the French sorrel, *Rumex sententia*, which has large, succulent, somewhat halberd-shaped leaves became used *R. acetosa* gradually ceased to be a garden sorrel, and gave place to the French species. The leaf is considered of great importance in French cookery and in the vegetable market in Paris is nearly as abundant during the season as peas are in those of London. There are several varieties of sorrel cultivated in French gardens. *Rumex acetosa*, the common English sorrel, is used by herbalists in making a cooling drink in febrile disease and also for cutaneous tumors. The leaves are oblong and tapering above, but even-shaped below. The plant known as sheep's sorrel, *Rumex acetosella* has a typical small halberd-shaped leaf, but is a troublesome weed in light sandy soil on account of its . . . underground stems which cause it to spread widely and render it difficult to eradicate. Several other plants are called sorrel—*Oxyria reniformis* of the same natural order is called mountain sorrel, and a very pretty little plant; *Oxalis acetosella*, N. O. Oxalidaceae is named wood sorrel. Like the true sorrels it contains oxalic acid, which indeed owes its name to this little plant which has trifoliate leaves and is often called the shamrock from its clover-like leaves. The red or Indian sorrel is *Hibiscus Sabdariffa*, Linn. N. O. Malvaceae, and has fleshy, red, succulent calyces, which are used in the W. Indies as an acid article of diet like tamarinds, but owing their acidity chiefly to malic and tartaric acids. The name of sorrel is also given to several other plants. Thus *Dodonaea viscosa*, N. O. Sapindaceae, called in Jamaica the switch sorrel, and *Rumex lunaria* Linn., called the tree sorrel in the Canary Islands. The name wood sorrel is given to *Begonia acutifolia*, and that of climbing sorrel to *Begonia scandens*, both natives of South America, where the stalks of some species of *Begonia* are used like rhubarb on account of their acidity.

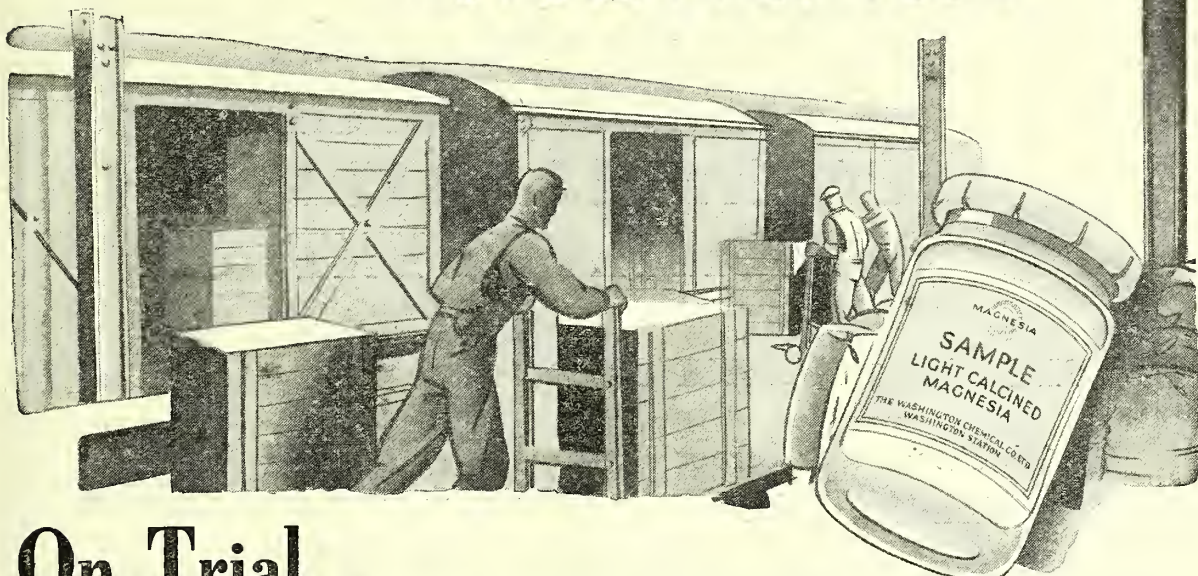
Sozoiodol is di-iodo-phenol-*p*-sulphonic acid, $C_6H_2I_2(OH).SO_3H=426$. It is a white crystalline powder, soluble in water and is used as an antiseptic.

Spa and Mineral Waters.—Natural mineral and spring waters are of many and diverse kinds, depending on the dissolved matter. Spa waters are those containing special constituents not usually present in ordinary (potable) water. They may be classified as follows:—*Acidic waters*, containing carbonic acid, usually together with bicarbonates held in solution by the excess of carbon dioxide, e.g., Seltzer, Kysibl and Bilin; some have been found to contain traces of sulphuric acid, probably derived from pyrites. *Alkaline waters*, containing an alkaline carbonate or bicarbonate sometimes accompanied by other salts, e.g., Vichy, Luhacovice and Ems. *Sulphated or bitter waters*, containing sodium, magnesium or other sulphates, e.g., Frantiskovy Lázně (Fransbad), Epsom, Seidlitz and Hunyadi-Janos; the waters at a number of Czech spas (Karlsbad, Marienbad, etc.) are sulphated and alkaline; those of Leamington, Cheltenham, are sulphated and saline. *Chalybeate waters*, containing ferrous bicarbonate and sometimes other iron salts, e.g., Tunbridge Wells, Pyrmont, Podebrady and some of the Harrogate and Buxton springs. *Sulphuretted waters*, containing the sulphides or hydrosulphides of the alkali or alkaline earth metals, e.g., Harrogate, Eaux Chaudes, Aix, Trencianské Teplice, etc. In addition certain saline waters contain notable amounts of bromides—Kissingen, Luhacovice, or iodides—Woodhall Spa (*C. & D.*, 1929, I, 85), Montpellier, Darkov and Ciz, whilst many hot springs associated with geysers contain dissolved silica, which is deposited around the mouth of the spring as the water is thrown up. Mineral waters do not necessarily contain much dissolved matter, some (e.g. Teplice) contain even less than the average domestic supply water. Almost every chemical element has been detected in some mineral water or other, but it is highly probable that many of the earlier analyses of the solid contents of many spring waters are erroneous, erring most frequently on the side of including too

much rather than too little. This has been referred to in the *Journal de Pharmacie* by Dr. Pierre Breteau, who deals with some of the difficulties encountered in evaporating large volumes of water. When this has been done in platinum dishes even that resistant metal has been found in the residues. Again, in some waters in which iron, aluminium, or several other metals are known to be present none of these have been found in the product left upon evaporation with a few drops of hydrochloric acid, because their chlorides have distilled off in the vast volumes of steam driven off. Undoubtedly many curative waters have been used from quite early times, and with good results. With the introduction of systematic analytical procedure in the past century the saline contents of all the important ones have been determined. Thus at the British Association meeting at Bath in 1888 Dalton gave a list of some 740 works dealing with the spa waters of England alone. The results of these analyses showed that the majority of such spa waters contained only traces of well-known simple salts whose effect upon the human system was relatively slight. It began to be thought that in many cases the alleged curative value of such waters had been exaggerated. At the same time mixtures were compounded to resemble the constituents of those waters of proved value, but these mixtures not infrequently had no marked beneficial effects. A more scientific explanation was put forward some twenty years ago by the late Sir William Ramsay, who traced the curative effects of Bath spa water, not to its saline content but to its feeble radioactivity. The waters at Buxton are also pronouncedly radioactive. Karlsbad Sprudel salts show an equal radioactivity which is naturally lacking in the artificially compounded mixtures of sodium sulphate, chloride and bicarbonate. Similarly, in his extensive investigations of the French mineral waters Prof. C. Moureu found considerable volumes of the inert gases (helium, etc.) accompanying these waters as they emerged from the ground, so that their beneficial qualities may also be attributable in part to radioactivity. Potassium salts were also shown to exhibit a feeble β -ray emission by Dr. N. R. Campbell in 1907, and this was confirmed by Henriot in 1909. It has recently been shown that potassium compounds isolated from plant ashes are apparently more radioactive than the ordinary potassium salts of mineral origin, and it is significant to recall that this element is an essential constituent of plant and animal life. Again, the significance of iodine in mineral waters has recently come to be recognised, and its estimation in waters has been the subject of a paper by Dr. R. L. Andrews before a meeting of the Society of Public Analysts. The value of iodide waters may be due to the element being present in a form readily assimilated by the human system. In any case, spring waters have come directly from Nature's own laboratory, where the prescriptions have been carefully made up for restoring the gouty, the rheumatic, the dyspeptic, the liverish, and (it must be added) the over-indulgent to good health once more.

Sparteine is a liquid alkaloid occurring in broom tops, *Cytisus scoparius*, having the formula $C_{15}H_{26}N_2$. It is obtained by treating the ground broom tops with dilute sulphuric acid, concentrating and distilling with excess of alkali in a current of steam. The distillate is exactly neutralised, evaporated to dryness and re-distilled over solid caustic potash. A final purification by redistillation in a current of hydrogen and dehydration over metallic sodium yields a colourless, transparent oily product, which darkens and becomes more viscous by oxidation on exposure to light and air. It is sparingly soluble in water, giving a strongly alkaline solution, and is readily soluble in alcohol, chloroform and ether, but insoluble in benzene. It readily forms salts, the sulphate being the one usually employed in medicine. Sparteine sulphate is a colourless, odourless crystalline powder with a bitter taste, soluble in water, 3 in 2, and in alcohol; the aqueous solution has an acid reaction and is levorotatory. Sparteine hydrochloride and periodide are occasionally used.

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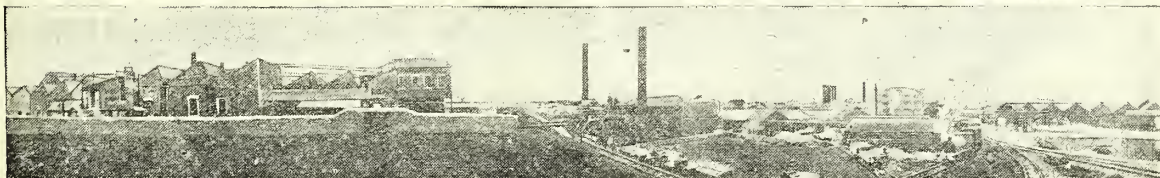


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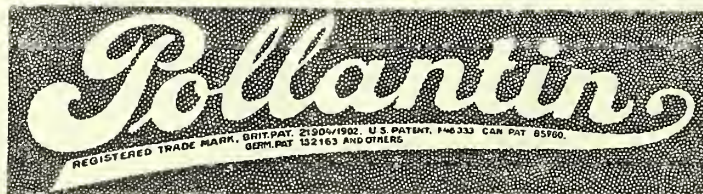
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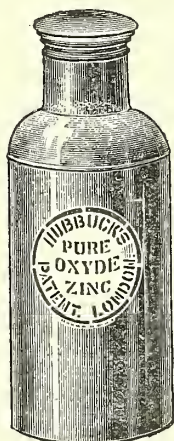
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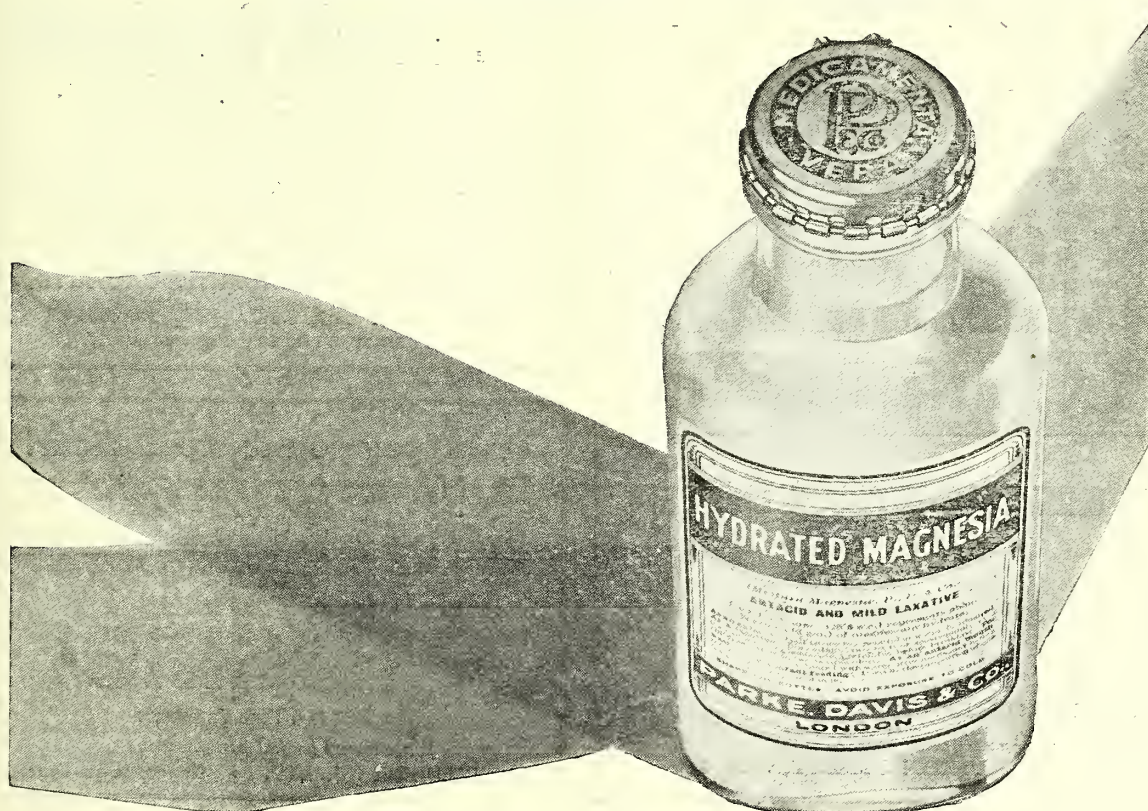
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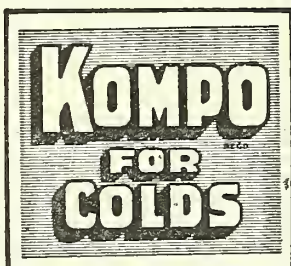
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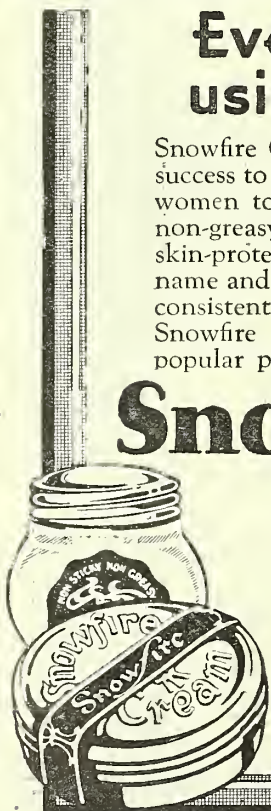
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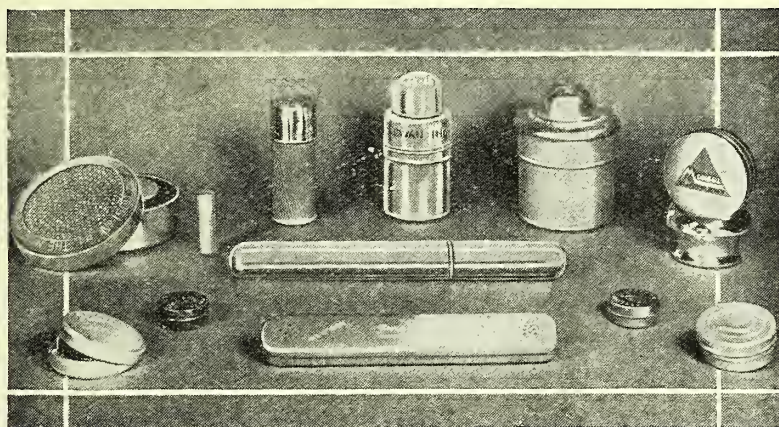


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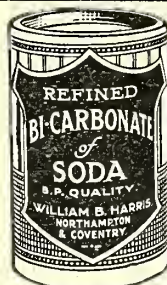
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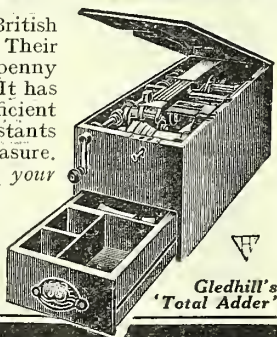
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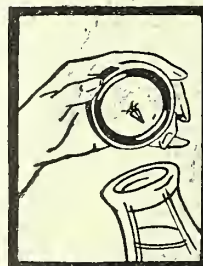
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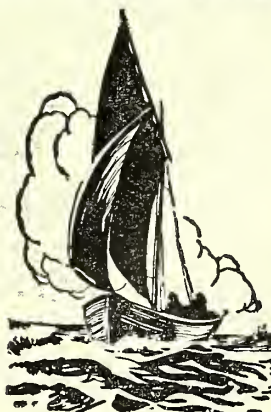
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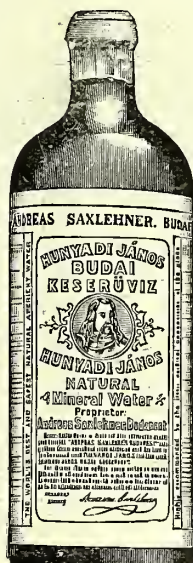
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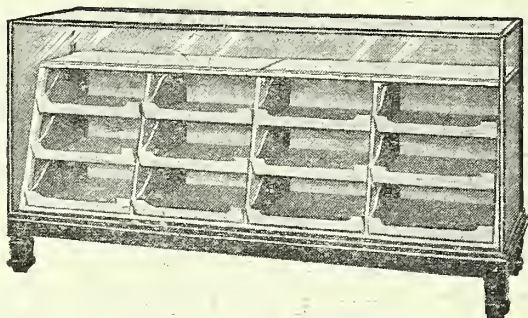
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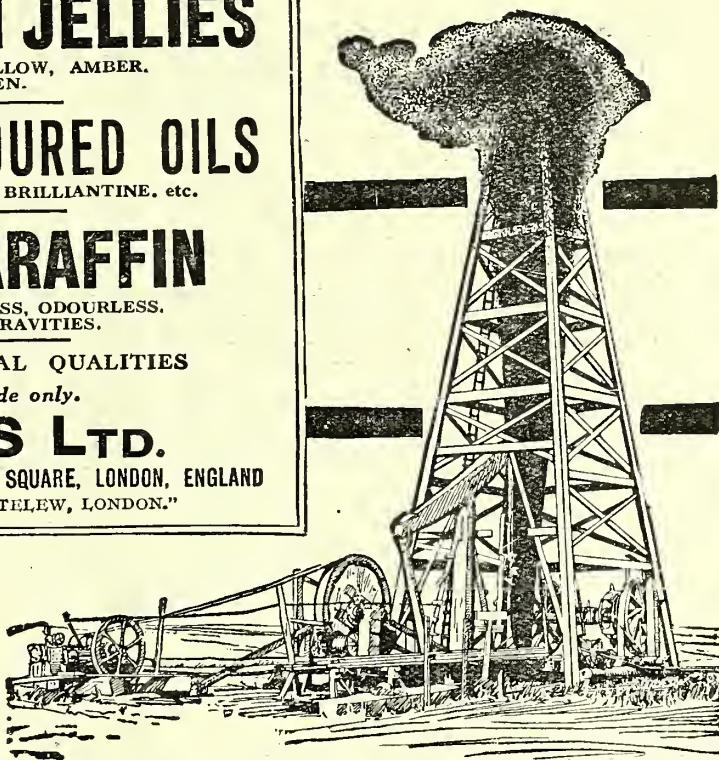
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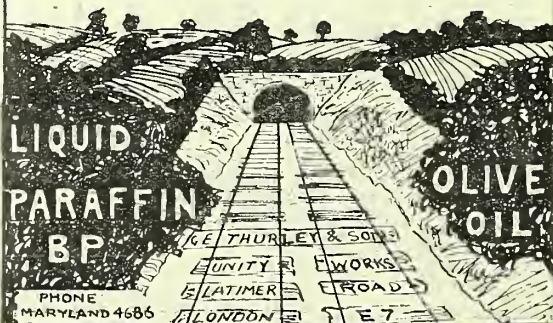
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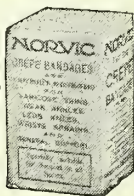
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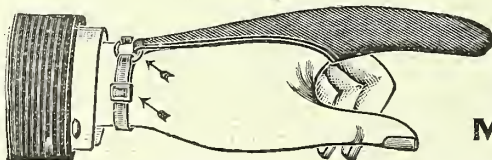
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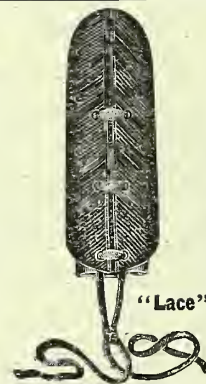
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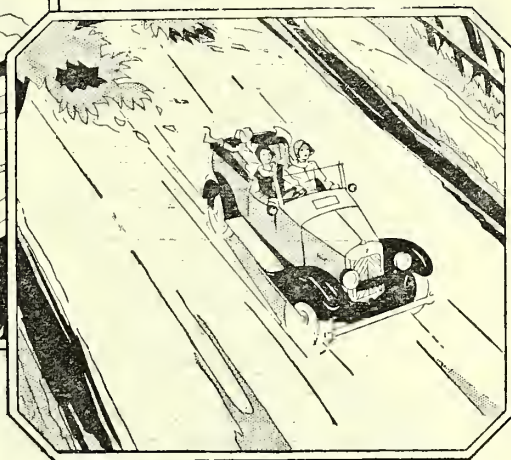
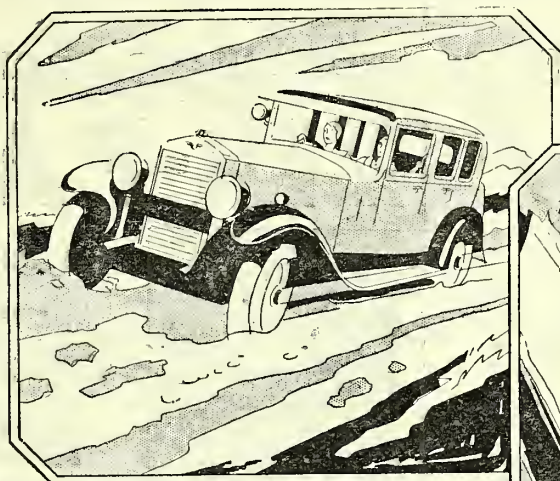
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"AUTO-TIE"



"Lace"



KOTEX *says*

it's not so much the car you ride in as the road you ride on

THERE is a Chinese proverb which tells us that one picture is worth a thousand words. And we believe that this picture really tells our story. However we are discussing a matter of business and it is most important that cleverness be sacrificed to the end that the story is completely understood.

Let us look at the picture again: on one side we see a luxurious motor-car—completely equipped and modern in every respect—beautiful to look upon but a source of discomfort and inconvenience to its occupants—simply because it is travelling a bumpy road. On the other hand, we see a small inexpensive ordinary motor comfortably plodding along—giving riding ease and pleasure, simply because it is gliding along a smooth road. In other words, motoring is dependent on both the car and the road.

Rather a homely story, isn't it? Yet, it graphically tells of co-operation and the subject is rather a homely matter. Co-operation dictates that you take the easy road—the road that's smooth—the road that gets you there quickest, with no inconvenience, no discomfort.

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of nation-wide distribution and finally topped off with a smooth coating of national advertising. And, all along the route, Kotex have placed signposts and guide marks in the form of consumer acceptance—all eager to point the way for you, Mr. Stockist, to profits.

But, in the final analysis, it is you who is at the wheel of the car. The road is a good one but you must drive yourself along it. Make it easy for your passengers—offer them a service which will bring them back again and again to travel the road with you.

First, give Kotex a prominent display in your windows. It's a positive connection between the national advertising and the consumer. Attractive window displays will bring people into your shop.

Once inside, again make it easy for them. Prominently display the Kotex packets on your counter. Our investigations prove that many women dislike asking for this product. Why not appreciate this and help them avoid embarrassment. Simply wrap a few packets, place them on the display so that any of your customers can simply step up, take a packet and complete the sale for you.

Let us repeat, co-operation is a homely thing, but, after all, it's the simple things of life which make for major successes. Kotex has paved the road for you—just climb in your car, open the throttle and speed along to the profits which this product holds for you.

KOTEX

78, SALUSBURY ROAD, LONDON, N.W.6.

Best sellers

The public is asking
for **ZEAL**
CLINICAL
THERMOMETERS
because they are:-

GUARANTEED TO
STAY ACCURATE
CONSISTENTLY
ADVERTISED

Made by

ZEAL

-the name the
public knows.

G. H. ZEAL, LTD.,
75 & 77, St. John St., London, E.C.1.



Hinders ZIX-PADS



THE
"INSTANT RELIEF"
PADS

which show over

38% PROFIT

with

BONUS

supported by

**NATIONAL PRESS
ADVERTISING**

Carriage PAID on all
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CONTENTS

8 pads for CORNS or

4 pads for BUNIONS or

4 pads for CALLOUSES

174/192 ESTCOURT ROAD,
LONDON - - - S.W.6

HINDERS ZIX-PADS 7 1/2
retail—per carton

SPECIAL WINDOW
FEATURES

Full particulars from

Hinders Limited

"Surco"

RELIABLE

**ELASTIC HOSIERY
BODY BELTS
TRUSSES
SUNDRIES**

WRITE FOR CATALOGUE

Surgical Hosiery Co., Ltd.

RUSSELL STREET
NOTTINGHAM

The "EVERSAFE"

PATENTED EVERYWHERE

**BABY
PACIFIER**

WITH THE NEW
COUPLING and

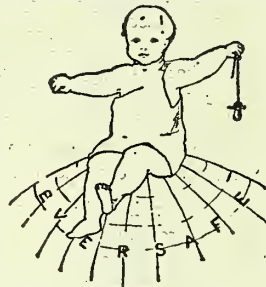
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PRICES**

HAS SECURED
SALES BEYOND
ALL PREVIOUS
RECORDS.

THE ONLY
PACIFIER WITH
INDIVIDUAL
WARRANTY.

All over the World

They are Acclaimed
the Favourite of
HIS MAJESTY THE BABY



REDUCED RATES—

No. 2. 3 1/2d. size 2 1/1 doz.

No. 2c. 4 1/2d. " 2 8 1/2 "

No. 3. 6d. " 3/4 "

Sample Order, 3 dozen

assorted, sent 7/9 post free.

Obtainable from all Wholesalers
or direct from Patentees.

ORDER YOUR
STOCK AT ONCE.

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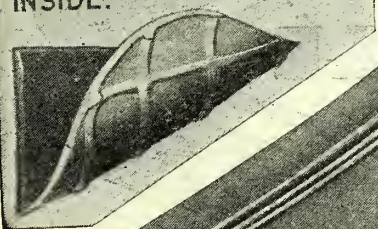
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Obtainable through
all leading
Wholesale Houses

Pharmal

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The Leyland & Birmingham Rubber Co., Ltd.
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Factories—Leyland, Glasgow, Mitcham, Preston, Dublin.

We have minimised production costs by equipping our Works with the most up-to-date machinery.

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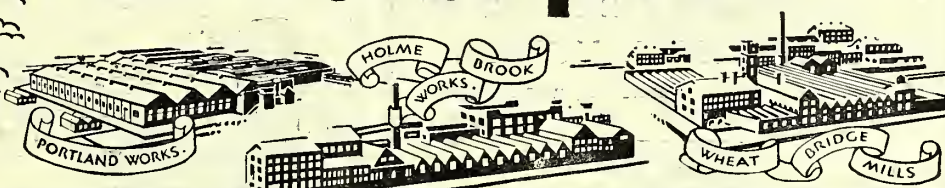
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Goods well packed are half sold. and easier selling means more sales.
We have expert box designers who specialise in designing boxes which are salesmen as well as packages. If therefore you have any packing troubles send them to CHESTERFIELD where our 90 years experience is at your disposal.

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MANUFACTURERS OF ROUND, OVAL, SQUARE AND FOLDING CARDBOARD BOXES.

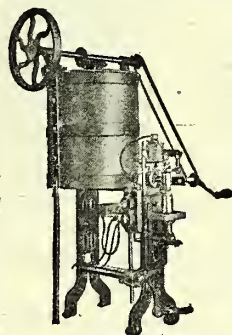
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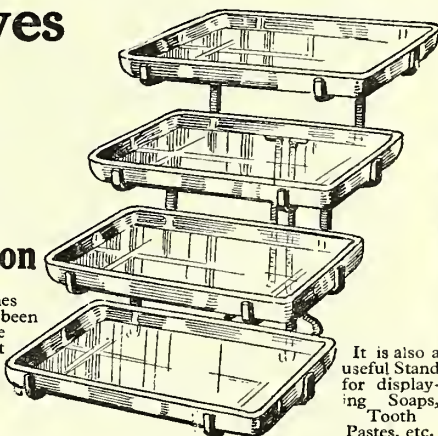
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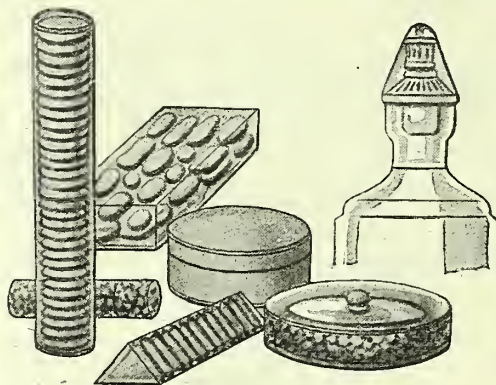
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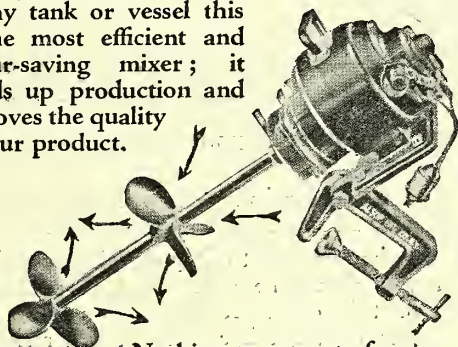
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"Viskap" in posi-
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There you have it—
Sealed! Perfect!!**VISKAP**
**HERMETIC SELF-FIXING
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Speed up mixing with the HY-SPEED MIXER

Quickly and easily attached to any tank or vessel this is the most efficient and labour-saving mixer; it speeds up production and improves the quality of your product.



Nothing to get out of order.
Just plug into a light socket.

Many of these Units are in use by leading firms with complete satisfaction.

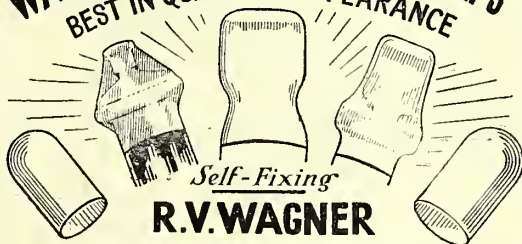
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Wholesale and Export only.
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Cheap Bottles at the best are a poor investment. Usually indifferently made, of poor metal—unevenly shaped—badly coloured, and of incorrect capacities—they cannot add prestige to your products.

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We make all kinds of glass containers—medicals, cheltenhams, panels, flats, rounds, emulsion, ink, feeding bottles, sauce, pickle bottles, jam jars, etc.

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Already throughout the country retail shops are displaying these window curtains to their great advantage. Not merely does it help them to sell Fairy Dyes and so add to their profit, it also forms a definite magnet of attraction and makes the passer-by stop and look in the window.

This is as it should be as Fairy Dyes want to help all round and while incidentally selling

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This is a helping hand—clasp it by sending to-day for a Fairy Dyes' window curtain.

It can be trimmed to fit your window and you will always be glad you took advantage of this offer. It comes to you free and post free, and is a gift you will really appreciate.

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Also at DUBLIN and BELFAST.

COMPLETE SET OF SAMPLES SENT TO THE COLONIES ON RECEIPT OF P.O. 10/6, WHICH IS CREDITED ON A £5 ORDER.

PHOSFERINE

New Window Display Conditions

Monthly Account.

Carriage Paid.

For a small Central Window Display of not less than 14 days and an order for £5 worth of Phosferine we allow a bonus of 10/6, on a £2 10 0 order 5/3.

This shows a net profit on the transaction to the Chemist of 35% besides attracting the passer-by to the window and considerably augmenting sales generally.

The above conditions apply only to the United Kingdom.

EXAMPLE.

		COST	SELLS FOR
3½ dozen 1/3 size at 12/- net	...	£2 2 0	£2 12 6
2 " 3/- " at 30/- "	...	3 0 0	3 12 0
		5 2 0	
Less 10/6 for Window Show	...	10 6	
		£4 11 6	£6 4 6

Showing a Net Profit of £1 13 0 on an outlay of £4 11 6.

Window Display Material Free and Carriage Paid.

WHOLESALE PRICES OF PHOSFERINE.

Carriage Paid.

Monthly Account.

1/3 size	...	12/- per doz. net.
3/- "	...	30/- " "
5/- "	...	48/- " "
12/- "	...	114/- " "

PROTECTED PRICES.

Phosferine and all of our Proprietary Medicines are supplied on the condition that they are not retailed in the United Kingdom under the following prices—viz., 1/3, 3/-, 5/-, and 12/-.

.....

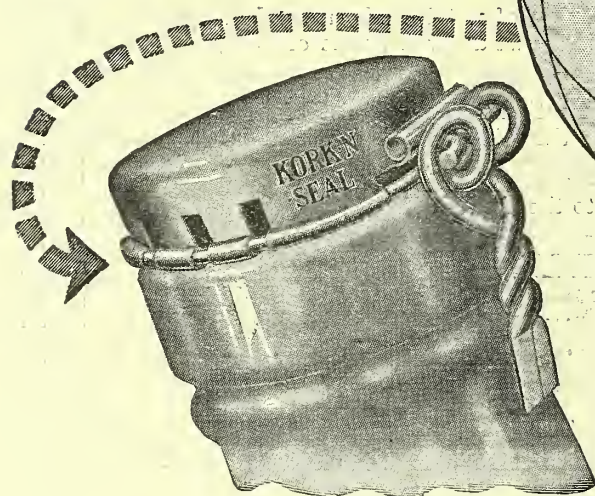
PHOSFERINE (ASHTON & PARSONS) Ltd., Ludgate Hill, LONDON, E.C.4.

Telephone No: CITY 8733.

Telegraphic Address: "PHOSFERINE, CENT, LONDON."

IMPORTANT.—Every care is used in corking and packing Phosferine, but occasionally a leaky bottle will pass undetected. Any leaky or faulty bottle should be returned to PHOSFERINE (Ashton & Parsons), Ltd., Ludgate Hill, London, E.C.4, when a fresh supply will be sent and postage refunded.

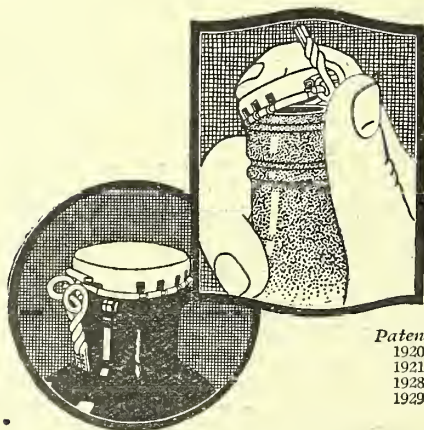
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now sealed with **KORK-N-SEAL**

(REGISTERED TRADE MARK)

The Cap with the Little Lever



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1921
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1929

THE greatest testimony to the supremacy of the KORK-N-SEAL closure is its adoption by the leading manufacturers of bottled and tinned products throughout the world. That is why customers regard it not only as the best closure but as a sign of the quality of the product.

British made throughout.

Address all enquiries to.

KORK-N-SEAL LTD.

Manufacturers of Aluminium and Decorated
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THE CHEMIST AND DRUGGIST SUPPLEMENT

28 ESSEX ST.
LONDON, W.C.2

JULY 26, 1930

This Supplement is inserted in every copy of The Chemist & Druggist.

THE CHEMIST AND DRUGGIST SUPPLEMENT

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Businesses Wanted and for Disposal, Premises to Let, Goods for Sale and Agencies—6/- for 50 words; every additional 10 words or less, 6d.

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2.—HAMFSTEAD.—General Retail and Dispensing Business, with Kodak Agency; returns exceed £2,000 per annum, with gross profit approaching £700; attractive shop; stock and fixtures estimated at £650; comfortable residence; held on lease; no reasonable offer refused; for immediate disposal owing to death of owner.

3.—WESTERN SUBURB.—General Retail and Dispensing Business; returns under management £2,100 per annum, with scope for increase; shop well fitted in mahogany and fully stocked; rent £90; sub-let £52; held on lease; price to be arranged; vendor is anxious to sell and will meet a purchaser reasonably.

4.—DALSTON (Near).—General Retail and Dispensing Business, with Kodak Agency; returns, present rate, £30 weekly, plus N.H.I.; single-fronted shop; stock and fixtures worth about £400; small living accommodation; rent £120; lease 19 years; price £500.

5.—METROLAND.—General Retail Business, with Kodak Agency; established by vendor about seven years ago; returns, 1929, £1,470; double-fronted shop in main road, very well fitted and stocked; convenient living accommodation, recently redecorated; net rent £85; held on lease; price to be arranged.

6.—TOOTING.—Cash Retail Business, with Kodak Agency; turnover last year about £1,950, with net profit approximately £600; single-fronted shop; stock and fixtures worth £625; 15 years' lease; net rent £46; house sub-let; price £1,100.

7.—ALDGATE (Near).—Old-established Cash Retail and Dispensing Business, with Kodak Agency and N.H.I.; situate in busy main road; returns about £4,500 per annum; large double-fronted shop, well fitted and stocked; flat over; long lease; open to offers.

8.—LINCOLNSHIRE.—General Retail and Dispensing Business, situate in commanding position; returns approximately

£2,800 per annum, increasing; stock and fixtures estimated to be worth £1,200; large house with private entrance; part could be sub-let and still leave ample living accommodation; rent £150, rising to £175; long lease; price £1,700.

9.—HAMPSHIRE.—General Retail and Dispensing Business; returns average £1,850 per annum, with gross profit 33.18 per cent.; double-fronted shop, well fitted and stocked; modern house; rent £100 per annum; 11 years' lease; price £1,250; family reason for disposal.

10.—NORTHERN ENGLAND.—Good-class General Retail Business, with Branch for disposal; private Dispensing and Kodak Agency; old established; combined returns £3,200; Post Office attached to main shop; net profit £700; estimated value of stock and fixtures £1,500; very good living accommodation at main shop; held on leases at reasonable rentals; price £2,000, or near offer.

11.—EASTERN COUNTY.—General Retail and Dispensing Business, with N.H.I.; returns £2,500 per annum apart from N.H.I., which is fairly heavy; run under management; approximate value of stock £750; very fine position; long lease; price £1,650.

12.—CENTRAL MIDLANDS.—General Retail and Dispensing Business, with Kodak Agency and large D. & P. connection; returns last year £3,802, under management; very good profits; double-fronted shop, well fitted and stocked; reasonable rent; long lease; price £3,000.

13.—DORSET COAST.—Cash Drug Store, with Post Office and Tobacconists; returns from Drug Store £1,500 per annum; combined net profit £450; living accommodation; new lease will be granted; price asked £1,500; part payment entertained.

14.—SOUTH COAST.—Good-class Retail and Dispensing Business, established many years; returns exceed £2,850, with gross profit approximately £1,200; double-fronted shop, well fitted and stocked; extremely good house, which can be sub-let to cover the whole of rent if so desired; long lease; price to be arranged; this business offers scope for increase under more modern management.

Messrs. O. & Co. desire to emphasize the necessity of a periodical Statement of Account by which means alone Profit, the Value of Business, &c., can be determined. Involving as this does the labour of stocktaking and Valuation, it is often omitted and eventually becomes confusion and loss.

Valuations for Stocktaking

Messrs. O. & Co. are prepared to undertake these essential duties and make SPECIAL TERMS for such service.

ORRIDGE & CO., 56 LUDGATE HILL, LONDON, E.C.4

THE VALUE

OF YOUR BUSINESS, WHETHER
FOR SALE OR ANY OTHER
PURPOSE, IS OF IMPORTANCE.
YOU CANNOT DO BETTER THAN
CALL IN FOR CONSULTATION
ONE WHO HAS HAD MANY YEARS

OF EXPERIENCE

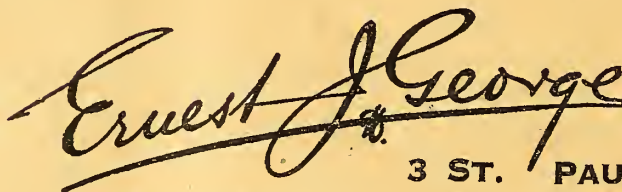
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BUYING, SELLING, STOCKTAK-
ING, TRANSFER, INCOME TAX.
THEREFORE SEND A LINE IN
STRICT CONFIDENCE TO

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"I need only say that the manner in which you carried out the
valuation and result are *eminently satisfactory to me and
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satisfaction."

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PARKIN S. BOOTH, Valuer.

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BUSINESSES FOR DISPOSAL

1.—LONDON, S.W.—Old-established Chemist's Business, held on lease 8 years at £56 p.a.; let off £91 p.a.; returns average £17/20, under management; premises consist of double-fronted shop with two rooms behind; price for lease and goodwill, £150; fixtures, etc., £150; stock at valuation, approximately £350. Further particulars on application. (43)

2.—LONDON, N.7.—Old-established Optical Business, combining recently established Pharmacy, held on lease with 14 years to run at a rental of £250 p.a., of which £135 is let on lease; returns £28 per week; very large shop, dispensary and sight-testing room, situate in busy main road; no opposition for some distance. Further particulars on application. (42)

3.—MANCHESTER.—Old-established Retail Business for quick disposal; yearly tenancy; rent £150; returns for the last 40 years average over £50 weekly; at present returns are £55 weekly; nicely fitted and good stock; Wine and Spirit Licence; living accommodation. (48)

4.—LIVERPOOL.—General Retail Business, with N.H.I.; established many years; turnover for year ended March 31 £1,340, plus N.H.I. £380; with capable supervision this could be considerably increased; tenancy yearly at rental of £75 per annum, plus rates; price asked £500 plus stock at valuation (approximately £475). (40)

5.—LONDON, S.W.—Recently-established Retail Dispensing Business premises on 15 years' lease at £150 per annum, of which part is sub-let at £104 per annum; returns 1929, £1,932, all cash; Kodak and U.C.A.L. Agencies; price for quick sale £1,100 all at, or £750, plus s.a.v. (approximately £425). (41)

6.—LINGS.—Established Dispensing and Retail Business for quick disposal in important town; 17½ years' lease to run at £200 per annum; returns average £50 per week; very large shop, situate in main thoroughfare; specially recommended.

7.—SOUTHSEA (Near).—Recently established Dispensing Business; lease will be granted at rental of £120 per annum; rates £14 6s.; returns £20 per week; no price asked for goodwill; double-fronted shop; good living accommodation; new premises. (47)

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CHEMISTS' VALUERS AND TRANSFER AGENTS,

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(One minute from St. Pancras and King's Cross Stations.)

1.—NORTH-WEST COAST.—High-class Retail and Dispensing with Kodak Agency; returns £3,250; net profit £700; good modern house; well fitted and fully stocked; price £22,000 or near offer.

2.—MIDDLESEX (Few Miles Out).—Good-class Family Retail and Dispensing, with Kodak Agency; returns over £2,400; gross profits exceed £1,000; audited accounts; excellent house, garage, etc.; owner retiring; price £2,000.

3.—EAST COAST.—High-class Perfumery and Toilet Business, with Confectionery; in fine main road position; returns £2,400; run as a Chemist could do another £1,000; excellent modern premises; good house and garden; owner retiring; price £2,000.

4.—BOURNEMOUTH DISTRICT.—Good-class Business, in fine main road position; returns £1,450, increasing; smart lock-up pharmacy, well stocked; price £850, or valuation terms arranged.

5.—HAMPSHIRE (Market Town).—Good-class Family Retail and Dispensing Business; returns average £1,850; audited accounts; modern pharmacy; good position; fully stocked; good house; price £1,250, or close offer; worth attention.

6.—SOUTH COAST (Death Vacancy).—Well-established Chemist's Business in rapidly growing centre; returns over £1,700 under manager; plenty of scope; handsome modern shop with house; price £1,250.

7.—ESSEX COAST.—Unopposed Light Retail, with Kodak Agency; returns £700; qualified Chemist could do £1,000; low rent; good house, garden and garage; stock worth £500; price £400.

8.—NORTH LONDON.—Good-class Light Family Retail, with Optics; in most desirable residential suburb; returns £5,500; main road position; low rental; valuable lease; price £2,650 cash; recommended.

9.—LONDON (Essex Suburb).—Light Cash Retail, in main shopping centre of densely populated district; returns £1,500; net profit about £300; stock and fixtures worth £550; price £625.

10.—LONDON, S.E.—Well-established Middle-class Cash Business, in main road position; returns £1,645; net profit £493; rent covered by sub-letting upper part; price £875; part can remain.

Estab. 1870.

Telephone: Terminus 3574.

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When Buying A Business or Partnership Consult Us —

We are not Transfer Agents, but we arrange GUARANTEED LOANS with the LEADING BANKS for qualified Chemists who require Capital.

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CHARLES C. MARSDEN

Chemists' Valuer, Transfer Agent & Stocktaker,
29 Oakwell Crescent, Oakwood, Leeds.

HUDDERSFIELD (near).—Chemists, Kodak, N.H.I., ret. about £1,300, lock-up, fixtures and goodwill, £250. Stock reduced to any figure to suit purchaser. A gift. HARROGATE.—Old-estab. Drug Stores, sell at V. of S. & F. abt. £600. Opening for chemist. LEEDS.—Small Pharmacy doing 300 scripts monthly average. Net profit £6 weekly. Rent 15/-. Price all at £295.

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CHEMISTS' VALUERS, TRANSFER AGENTS
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PREMISES WANTED

WANTED TO PURCHASE IMMEDIATELY.

SHOPS in Preston, Blackpool, Grange-over-Sands and Settle, occupying unique positions and suitable for Chemists' business.

Good price will be paid for suitable property, or would rent on lease.

No commission required.

Send full particulars to—

DUNCAN B. GRAY & PARTNERS,
Westminster Bank Chambers, Lord Street, Southport.

PREMISES FOR SALE.

£1,300 (85% mortgage arranged).—Freehold Shops, with living accommodation, at Heston-Hounslow; opening for Chemist. Full particulars from Horne & Sons, 177 High Street, Hounslow.

BUSINESSES FOR DISPOSAL.

6s. for 50 words or less; 6d. for every additional 10 words or less, prepaid.

BLYTH, NORTHUMBERLAND.—For Sale as a going concern, the Business of Manufacturing Chemists and Wholesale Druggists, carried on by Macsons, Limited; stock and fixtures at cost, property at valuation. Apply to the Managing-Director at Union Street, Blyth, Northumberland.

FULHAM.—Double-fronted Shop in populous neighbourhood doing good Retail and Dispensing business; well fitted and stocked; 4-room flat above; lease 8 years; net rent £31 per annum (part let off); takings, under management, £20 per week; price for quick sale £550, to include stock value £350. Prestons, Valuers, 29 Ludgate Hill, E.C.

KENSINGTON, S.W.—Small Branch Business; must be sold quickly; rent £70; sub-let £200; suit lady; bargain price, about £350 required; no reasonable offer refused. Full particulars, 164/20, Office of this Paper.

LANCASHIRE.—Chemist's Business for Sale in rapidly growing district; tram route; well stocked and modern shop fittings; returns increasing; Kodak Agency; good living accommodation; price £400, all at, or nearest offer; will soon be worth double; genuine buyers only. 185/14, Office of this Paper.

LANCASHIRE COAST RESORT.—Progressive General Retail, Dispensing and Photographic Business; excellent position; large corner shop on main road; good lease, £85 per annum; well stocked and fitted; Kodak and Ucal Agencies; returns average now £22 week at good profits; increase assured; price £200, plus stock and fixtures at valuation; good reasons for disposal. 185/25, Office of this Paper.

LEEDS, £295.—Lock-up Business with basement and two rooms above shop; busy cross roads; working-class district; Kodak Agency; N.H.I. 300 monthly; business capable of great development; fine chance for go-ahead man; present returns could be trebled; has been managed by young lady. 184/27, Office of this Paper.

LINCOLN (High Street).—To Let, at once, well-established Chemist's Shop and Business, with valuable goodwill and stock, situate in best shopping centre of city. Apply Geo. L. Tinsley & Laverack, Agents, Bank Street, Lincoln.

LIVERPOOL.—Branch Pharmacy, main road, central shopping position of thickly populated district; takings, under manager, £1,300; remarkable scope for development; handsome mahogany fittings; stock valued £320; long lease; living accommodation; will accept £700 for quick sale. "K. G. M., 187/12, Office of this Paper.

LONDON, S.E.—For disposal, compact small Business; average net profit £450; capable of increase; accountant's figures; terms, valuation of stock and fixtures, plus an agreed sum for goodwill; good living accommodation. 184/35, Office of this Paper.

LONDON, S.W.—General Retail; scope for increase all round; returns £1,200; net profit £340; rent £65 per annum; sub-let £78; vendor, who is obliged to leave business through ill-health, will accept low price for quick sale; splendid chance for man with small capital; particulars at interview. 186/32, Office of this Paper.

LONDON, W.—Middle-class Business, with large Photographic; taking £30 per week (has done more) under manager; could be increased with personal attention; suit qualified or unqualified; small Dispensing; low rent; lock-up shop; 6½ years' lease; profit about £350; price for fixtures, fittings and lease £250; stock about £400; part could remain. 186/300, Office of this Paper.

LONDON, E.—Old-established Branch Pharmacy for Sale, with large Panel; no opposition; suit young man not afraid of work; rent £60; house above; side entrance; long lease; price £800. 174/195, Office of this Paper.

NORTH LONDON.—Main road; busy shopping centre; working-class; Dispensing and Photographic; good lease; low rent; living accommodation, 5 rooms; average net profits £9 10s. per week; price £850, all at, including stock value approximately £500. Prestons, Valuers, 29 Ludgate Hill, E.C.

N.W.—SOUND little Business in thickly populated area, shop and 2 rooms, doing £13 per week now (mostly drug sales); winter trade considerably more; scope for much expansion; Kodak Agency; low rent and satisfactory lease; all at £350 or near; personal investigation invited; make excellent branch. 185/38, Office of this Paper.

SOMERSET.—Business, established in 1910, corner position, with house in centre of growing town; two large windows, warehouse, storerooms, etc.; exclusive agency; some Optics; average return for past 5 years £1,875; to be sold immediately at valuation, plus small amount for goodwill; about £1,100 all. 181/6, Office of this Paper.

SOUTHSEA.—Cash Pharmacy with house attached for Sale; owner retiring from pharmacy; usual Agencies; rent £200 per annum; rates £28 10s. annually; 21 years' new lease, or property may be purchased; particulars at interview only to those with banker's references; price £3,300 cash. 174/197, Office of this Paper.

SOUTH YORKSHIRE.—Cash Retail Business, with Kodak Agency, N.H.I. and Medicated Wine Licence; small rent; lease; no near opposition; takings approximately £20 weekly; well stocked and fixtured; good window; price £550, or at valuation. 184/38, Office of this Paper.

A BARGAIN.—£500. Smart Country Pharmacy, with Tobacco and Sweets as side line; large shop and two rooms; splendidly fitted and well stocked; nearest opposition 6 miles; easily worked; comfortable living; rent and rates £24 10s. per annum. Apply Anderson, Chemist, Ecclefechan, Dumfriesshire.

DRUG Store, East London; lock-up shop; growing district; no opposition; facing Bryant & Mays, 2,500 girls; £50, stock and fittings. 523 Old Ford Road, Bow, E.3.

HIGH-CLASS Dispensing and Light Retail Business, in good residential district, 30 miles from London; turnover about £3,500 (present rate); excellent profits; books audited; every investigation courted; fully stocked; price £2,000; banker's reference required. Apply "G.W.R.," 174/196, Office of this Paper.

IMMEDIATE POSSESSION.—Pharmacy in industrial town, near Liverpool; well stocked; good N.H.I. practice; leasehold premises, with house included; good reasons for leaving; accounts for last 3 years available; returns £900/£1,000 per annum. 185/12, Office of this Paper.

NET income £320; small outlay £650, or nearest reasonable offer; country pharmacy; lock-up; electric light; Kodak, Ucal, N.H.I.; lease 3 years; rent £50; rates £6; turnover £1,200; profitable Proprietary; stock, fixtures, £525; suit lady, young, single; make money; elderly, semi-retire; nearest opposition 4 miles. "Clemicus," c/o 185/21, Office of this Paper.

PHARMACY, in a good-class residential district on Essex Coast; well fitted and stocked; returns average £1,200 per annum; has done more, but at present neglected; excellent scope for increase and with good opportunity for Optics; Kodak Agency; good six-roomed house; lease granted at £120 per annum; price of business £800, or near offer. 186/15, Office of this Paper.

30 MILES FROM CHARING CROSS.—Recently established, flourishing Family and Light Retail Business; medium and working-class, in main shopping thoroughfare of busy market town; large premises with living accommodation; long favourable lease; price about £1,400, part of which could remain. Full particulars given to genuine inquirers giving banker's reference. 184/18, Office of this Paper.

£1,750 OR near cash offer purchases old-established Business in Western market town; Family and Photographic; Kodak Agency; profits £400; excellent living accommodation; long lease; low overheads; full details receipt of banker's reference; genuine reasons for disposal. 185/28, Office of this Paper.

BUSINESSES WANTED.

LONDON OR PROVINCES.—Sound Business wanted, doing profitable trade, for investment up to £6,000. Particulars of turnover, gross and net profits, amount salaries, approximate amount stock and fixtures, and price "all at" to 186/37, Office of this Paper. Strictly confidential.

MANCHESTER.—Chemist's Business required in working-class district; tram route; plenty N.H.I. scripts. Apply 186/34, Office of this Paper.

WANTED.—Good Retail Chemist and Dispensary Business in market or seaside town, preferably South or South-West; applicant prefers to rent premises, might purchase; only genuine concerns considered, which must stand every investigation; applicant has capital available and inquiry quite genuine. Send details as to price to Hankinsons, Estate Agents, The Square, Bournemouth.

WANTED to purchase for cash, Pharmacy or Drug Store doing anything up to £2,000 in London or suburb (not East). 186/13, Office of this Paper.

WANTED, good-class Drug Stores or Pharmacy, with living accommodation; South preferred. Apply to 186/35, Office of this Paper.

APPRENTICES.

APPRENTICE (male) required for a high-class Dispensing Pharmacy in N.W. London. 185/6, Office of this Paper.

SITUATIONS OPEN.

RETAIL (HOME).

BIRKENHEAD (Near).—Qualified Manager required early August for lock-up branch; middle-class, with N.H.I.; must be energetic and possess initiative, an experienced Dispenser with knowledge of Photography, good Window-dresser. Apply, giving references, age, experience, if married, etc., to Mandalay, c/o John Thompson, Ltd., Duke Street, Liverpool. Applications not answered in three days respectfully declined.

BIRMINGHAM.—Qualified Assistant required for working-class business; short hours and light duties; would suit lady or elderly man. Please give full particulars re wages (must be low), etc., to "Chemist," c/o 155 Selly Park Road, Birmingham.

BIRMINGHAM.—Qualified Manager required for high-class business; must be smart in appearance and a tactful Salesman. Reply, giving age, wages required, and when free, 184/36, Office of this Paper.

BIRMINGHAM.—Manager, must be keen and energetic, for modern industrial business; good display man essential, with previous experience in N.H.I. and busy Counter trade. Full particulars, age, previous experience, and when free to 184/194, Office of this Paper.

BRIGHTON.—Wanted, at once, unqualified Assistant for good-class suburban business in Brighton; good Counter manner and Photographic knowledge essential. Please give full particulars as to age, experience, references, and wages required. Edgar Jones, Pharmaceutical Chemist, 94 Preston Drive, Brighton.

BUXTON, DERBY.—Qualified lady or gentleman immediately, accustomed to Photographics and Window-dressing. Give particulars and wages required. Sutcliffe's, 17 High Street, Buxton, Derby.

EAST HAM.—Wanted, at once, qualified Chemist to manage small business in working-class district; Family Prescribing, N.H.I., Photography, etc. Apply personally any time, or write, giving full particulars and salary required, which must be moderate. Fookes, 34 Vicarage Lane, East Ham.

GOLDERS GREEN.—Young lady required for Counter work; must be smart and used to Toilet Department in general Chemist's business. State age, previous experience, etc., and when free to 184/19, Office of this Paper.

LONDON, E.—Capable Manager required for busy industrial business, with house attached; must be a keen and energetic Salesman and good Window-dresser; liberal salary and commission with excellent prospects for one who is really hard working and keen to get on. State age, previous experience, and when at liberty to 184/191, Office of this Paper.

LONDON, S.W.—Young lady, aged 16 to 17, to assist generally in Retail Chemist's and learn the business; preference given if residing near Fulham. 184/16, Office of this Paper.

LONDON, N.—Qualified Manager; good prospects for smart man; must be a good window-dresser, with up-to-date ideas and keen and energetic Salesman; modern Family business with house attached; good salary with commission. Give full particulars of previous experience, age, and when free to 184/192, Office of this Paper.

LONDON, E.—Assistant; permanency; unregistered; good Salesmanship, Window-dressing and business acumen more important than technical ability; no Sunday; no dispensing; fixed salary; commission on sales and business increase. State fully age, experience, and salary expected to 181/5, Office of this Paper.

LONDON, W.—Young, qualified Assistant (male) for N.H.I. Dispensing and quick Retail. Windwood, 96 Askew Road, Shepherd's Bush, W.12.

LONDON, S.W.—Part-time Relief; qualified; experienced Counter and Dispensing; middle-class trade; each Thursday and alternate Sunday 6 till 7.30; state experience and salary. 186/30, Office of this Paper.

LONDON, S.E.—Temporary qualified Assistant wanted immediately for about 10 weeks; one accustomed to good-class Dispensing Store business preferred. Full particulars in first letter, age, salary required and experience. 186/25, Office of this Paper.

LONDON, S.E.15.—Assistant wanted for a Retail business; must be a capable Dispenser; from August 1 to September 13; whole time, or Fridays and Saturdays only. Applicants please state age, experience and remuneration required, to 186/38, Office of this Paper.

LONDON, N.—Qualified Assistant, young, required. Full particulars, salary, etc., in first instance, Box 174/192, Office of this Paper.

LONDON, S.E.—Junior, for Stock, Windows and Dispensing. Brief particulars and salary to 174/198, Office of this Paper.

LIVERPOOL.—Qualified lady for August and September; busy Counter and Dispensing. Full particulars and salary required; enclose photo. 185/19, Office of this Paper.

NORTH STAFFS.—Qualified Manager required for good-class Light Retail business; knowledge of Optics an advantage; house attached. Full particulars to G. W. Brown, Ltd., 58 Hope Street, Hanley, Stoke-on-Trent.

SOUTH COAST.—Gentlemanly Junior, with good Dispensing experience, wanted now to September 13; no Sunday or extra duty; good hours; salary 55s. week. Witchell, 3 The Broadway, Worthing.

STAFFORDSHIRE.—Qualified Assistant required to take charge of Dispensing Department in large Family business; must be quick and accurate Dispenser, keen to make progress. Full details of previous experience, age, and when at liberty to 184/193, Office of this Paper.

SLAITHWAITE & DISTRICT CO-OPERATIVE SOCIETY, LTD.—Wanted, for new Pharmacy and Optical Department, qualified Manager with Optical Diploma (J.C.Q.O.). Give full particulars, stating age, wage and experience; first letter copies only of testimonials if sent. Apply Secretary, Slaithwaite & District Co-operative Society, Ltd., Slaithwaite.

SURREY.—Wanted, temporary Assistant, qualified, young, for 3 weeks from August 2; two kept. State references and salary required. 185/30, Office of this Paper.

SUSSEX.—Qualified Manager required for popular seaside resort (permanency); applicants should possess managerial and display experience and be good Salesmen; bonus and commission offered; house also available. Write, giving full particulars of experience, age, height, wage, and when at liberty. 185/37, Office of this Paper.

WEST LONDON HOSPITAL, HAMMERSMITH, W.6.—Required, a qualified Assistant Dispenser (male) with Hospital experience; salary £220; hours 9 a.m. to 6 p.m. Apply, stating age, with copies of testimonials, to the Pharmacist.

WORCESTERSHIRE.—Smart Ass'tant required for busy Family business in market town; must be accurate Dispenser and used to heavy N.H.I. Full details of previous experience, when at liberty, and salary required to 184/195, Office of this Paper.

A QUALIFIED Manageress for village branch first week in August. Full details of previous experience, salary required, etc., to Hillman Attwell, M.P.S., Cranleigh, Surrey.

A SSISTANT of good appearance and address required for Dispensing and Counter. In applying please state previous experience and salary required. W. W. Brunton & Co., 240 Earl's Court Road, S.W.5.

A T once, qualified Manager or qualified Assistant, able to manage, for middle-class business; outdoors; permanency. State age, experience, and salary required to G. A. Pickering & Son, Chemists, Royston, near Barnsey.

JUNIOR required for high-class Dispensing business; also vacancy for Apprentice. W. Browne & Co. 509 Finchley Road, Hampstead, N.W.3.

JUNIOR or unqualified Assistant wanted immediately; permanent. Apply Jack Robinson, Ph.C., 33 St. Mary's Road, Ealing, W.5.

JUNIOR Assistant wanted for Counter and Dispensing. State age, experience, salary, and references; photo (will be returned) Brice & Son, 172 High Street, Uxbridge.

JUNIOR, unqualified Assistant (male) wanted, principally for Counter and used to good-class brisk Retail and Dispensing business; outdoor. Apply, with full particulars, to A. H. Price, Ph.C., 2 Guildford Road, Woking, Surrey.

LOCUM required for August 8, or before; good Dispensing experience essential; for two weeks, possibly more; give references, salary required, etc. Apply George Ingle, 26 Barrack Road, Northampton.

LOCUM, unqualified, wanted from August 4-16. Apply Hargreaves, Chemist, 244a High Street, Lewisham, S.E.13.

LOCUM, qualified, wanted for one month from August 18; active and with undeniable references. Full particulars to Macarthy, Chemists, Romford.

LOCUM (R.P.U.) wanted for last two weeks of August, and possibly longer, for London area. 185/23, Office of this Paper.

LOCUM, unqualified, required from August 5 to 16. State wages required, full particulars and references to A. S. Bowen & Son, Ltd., Chemists, 633 High Road, Leytonstone, E.11.

MANAGER, qualified, under 35, used to N.H.I. work; good references and Salesman; working-class. Apply 207 Munster Road, Fulham.

QUALIFIED Dispenser to assist in management; near London, Essex. Give full particulars, with references and salary wanted. P.C.B. 72/2, Office of this Paper.

QUALIFIED Assistant (permanent preferred) from August 11; West-End experience desirable; must be of good appearance and tactful Salesman; not over 35. State age, height, experience, salary required, and references. G. H. Pierson, 94 Queen's Road, Bayswater, W.2.

QUALIFIED lady Assistant required for country town business, 25 miles London. State full particulars, salary required, etc. Richards & Bowring, Ltd., Wickford, Essex.

QUALIFIED, gentlemanly Assistant required for West-End business at the end of August. Particulars of experience and salary to 186/39, Office of this Paper.

QUALIFIED (lady or gentleman) to manage small Country Stores in Midlands; three miles from large town; salary depends on progress made. Full particulars, salary, photo, etc., wanted in first letter to 186/26, Office of this Paper.

TAYLORS CASH CHEMISTS require a smart qualified lady for one of their branches within 12 miles of Manchester. Apply Supervisor, 51 Piccadilly, Manchester.

UNQUALIFIED Assistant for Dispensing, Window-dressing and Counter; must have knowledge of Photographic and Toilet trades. State age, height, experience, salary, and when free to E. E. Russell, Chemist, Leitchworth, Herts.

UNQUALIFIED Assistant, London, N., must be quick and accurate Dispenser, for busy N.H.I. business; also quick Counterman essential. Full details, age, experience, and when free to 184/190, Office of this Paper.

UNQUALIFIED, quick N.H.I. Dispenser, accustomed to general shop work; about 25 or 30; North London. Please write details to 185/5, Office of this Paper.

WANTED, a qualified Manager for small branch. State age and wages required. Apply Waller & Riley, Ltd., Bradshawgate, Bolton.

WANTED, shortly, young, qualified M.P.S. with a knowledge of Photographic Sales; accurate Dispenser. Counter and Window-dresser; good opportunity for man who will do his best. State salary required. 174/189, Office of this Paper.

WANTED, shortly, young lady Assistant who has had a little experience and is wanting to gain more; good at Counter and Window-dressing; the berth also supplies an opportunity to learn Post Office routine. Apply, giving full particulars and salary required, to Simnett, 72 Emmanuel Road, Balham, S.W.12.

WANTED, Junior Assistant, unqualified, for four weeks. Apply, stating age, experience, salary and references, Henry Chapman & Sons, 52 Newborough, Scarborough.

WANTED, at once, young, unqualified Assistant of good appearance and address; good Dispenser essential. J. M. Hughes, Ltd., High Street, High Wycombe.

WHOLESALE.

A NEW line for Salesmen calling on Retailers and Wholesalers; profit basis; British made Razor Blade. Details, "A. P.", Ace of Blades, Ltd., 36 Basinghall Street, E.C.2.

A DVERTISING Clerk wanted for general work in Advertising Department of London firm; previous advertising experience not essential, but advantageous. State former experience and duties, age and salary required. 174/193, Office of this Paper.

NORTH OF ENGLAND.—Part-time Representative, with live connection, wanted for Northumberland, Cumberland, Westmorland and Durham by well-known House, specialising in Pills, Tablets, Toilets, etc.; commission basis. Applications, giving full particulars, will be treated in strict confidence. 174/194, Office of this Paper.

OLD-ESTABLISHED Manufacturing Chemists require a Representative for South-East England, from Portsmouth to Peterborough, excluding London; one with knowledge of the ground and experience of Retail Chemists' trade; advertisers have a good connection, and are looking for a man who can increase it. State full particulars of experience and remuneration expected to 174/186, Office of this Paper.

R EPRESENTATIVE required for middle of August for West of England and Midlands; candidates must be well educated, of strong personality, and expert salesmen, capable of handling Perfumery and exclusive French Sundry Lines; own car an advantage. Write, in first place, giving fullest details of past experience, etc., which will be treated in strictest confidence, to "T. H. B.", Spurways, Ltd., 89 Great Eastern Street, E.C.2.

R EPRESENTATIVE wanted, age not exceeding 35; South Coast; experience calling on Chemists; salary and expenses. Apply, by letter only, to 174/190, Office of this Paper.

R EPRESENTATIVE required by old-established house to call on Chemists in London north of Thames; not less than 5 ft. 10 in. in height, of good address, and gentlemanly appearance; fidelity guarantee required; preference given to a young qualified man with some salesmanship experience; salary and commission will be paid; after proof of ability an option may be given to obtain a holding in the company; this opening presents an opportunity for an ambitious and hard-working man to make some progress. Apply in first instance, stating experience and salary required, "Chemist," c/o F. Wilson, 101 Hatton Garden, E.C.1.

TRAVELLER for old-established Soap and Perfumery House with sound connection; West-End, including Stores and suburbs; salary, expenses and commission; own car an advantage. Full particulars to P.C.B. 72/4, Office of this Paper.

TRAVELLERS, calling on Chemists, Stores, etc., required to carry Toilets, Perfumery, etc.; small range of samples; commission only. Write, stating area, with full particulars and references, 174/191, Office of this Paper.

WANTED, two young Chemists for a new factory, North London; experience in the Manufacture of Organic Fine Chemicals preferred. State age, with full details of experience and salary expected, to 174/188, Office of this Paper.

WANTED, boy, 17 or 18 years of age, as Apprentice to learn Wholesale Chemists' trade; chemist's son preferred; good schooling necessary. 174/187, Office of this Paper.

SITUATIONS WANTED.

RETAIL (HOME).

A.A.A.A.A.—YOUNG, qualified Scotsman, now managing London shop, wishes change; free one month; £5. "Chemist," 42 Vernham Road, Plumstead, S.E.18.

A.A.A.—ASSISTANT; 26; tall; competent; energetic; excellent experience, including West-End; Dispensing, Counter, etc.; unqualified; free one month's notice. Smith, 90 Staines Road, Ilford, Essex.

A.A.A.—FIRST-CLASS Assistant; good Salesman, Dispensing; all-round experience; tall; 31; some French and German; energetic; trustworthy; ten years WEST END; excellent references. "Cyanide," 174/199, Office of this Paper.

A.—QUALIFIED, 31, desires post as Manager or Senior exors. Assistant; South of England; previous experience; excellent references; at present in employ. "H.," 119 Hankinson Road, Bournemouth.

A.—QUALIFIED desires post as Manager; S.W. preferred; exors. married; 32; excellent references and experience, Counter, Dispensing and Photography; interviews Wednesday afternoon or Sundays. 184/39, Office of this Paper.

A.—QUALIFIED; over 20 years' experience; permanency preferred. Apply 184/25, Office of this Paper.

ACTIVE M.P.S.; Manager; middle-aged; married; suburban, country; good references; present post 17 years; reason exors. selling; £4 10s. per week and commission; house. BM/ZPDT, London, W.C.

ACTIVE, middle-aged, qualified, varied Managerial Wholesale and Retail experience, desires Locum or permanency; unimpeachable record. 180/17, Office of this Paper.

ADVERTISER, qualified, late own business, seeks Managership, view succession; live over; neglected with scope; cash deposit and instalments; south of Thames. 185/40, Office of this Paper.

ALERT Assistant; 6 years' good experience, Counter, Dispensing and Window-dressing. J. Chatwin, 170 Villa Street, Lozells, Birmingham.

AS Locum or Assistant; good references; abstainer; disengaged September 1. "H. G.," c/o Mr. Dowty, Chemist, Bitterne, Southampton.

AS Manager or Senior; qualified; age 40; good all-round experience; steady and reliable. P.C.B. 72/10, Office of this Paper.

AS Manager; experienced Chemist and Optician; registered J.C.Q.O.; expert Refractionist; good Salesman; keen on business; excellent references. 186/7, Office of this Paper.

AS SUPERINTENDENT—Pharmacist open for two weeks to become *au fait* with current prices and N.H.I. Dispensing; no or very small salary; London; interview immediately. 186/36, Office of this Paper.

ASSISTANT, 24, employed West End, desires change; Wholesale or Retail. Hunter, 69 Shepherd's Bush Road, W.12.

ASSISTANT; 26; unqualified; ten years' experience; N.H.I., private; Counter; quick; conscientious; obliging; Northern Counties preferred, not essential. 187/10, Office of this Paper.

ASSISTANT requires London post; Retail Pharmacy; middle class preferred; Private and N.H.I. or Hospital; passed dispensing and pharmacy in examination, though unqualified; best references; sound knowledge of Analytical work, Chemical, Surgical and Electrical Apparatus; age 21; height 6 ft.; good appearance and personality; disengaged. "F. W.," 92 Montpelier Road, Brighton.

ASSISTANT; unqualified; 25 years' good all-round experience (London and country); good credentials. "Chemicus," 69 Upper Richmond Road, Putney.

ASSISTANT; experienced; Dispenser, Salesman and Photo; active; single; middle-aged; disengaged. "Statim," c/o Miss Drewery, Kingsbridge House, Bracebridge, Lincoln.

ASSISTANT; unqualified; age 26; high-class experience only; Dispensing, Counter, Window-dressing, Photography; excellent references; free August; Midlands preferred, but not essential. 185/8, Office of this Paper.

ASSISTANT; unqualified; experienced; locum or permanent; disengaged September 1. "Aspirin," 72 Tremadoc Road, Clapham, S.W.4.

ASSISTANT; unqualified; married; 39; tall; good all-round man; Counter, Photo and Dispensing; last place 8 years; Birmingham and district preferred. 185/32, Office of this Paper.

CAPABLE Pharmacist, disengaged August 18, requires progressive situation; young; excellent references. Apply Davies, 1a Herbert Road, Plumstead.

ENERGETIC, capable, obliging Assistant seeks berth; good Salesman; unqualified; disengaged; country preferred. 186/31, Office of this Paper.

EXPERIENCED, qualified Manager, married, desires change; 10 years' London branch managership; 3 years present post; seaside or large town in South-West England preferred. "Chemist," 39 Queen Street, Newton Abbot, Devon.

FORTNIGHTS or longer; Chemist, experienced in all branches, completing nine weeks' locum engagement July 31, seeks Locum appointments for August and September in good-class businesses. Fitt, c/o Mr. Shepperd, 94 Boutport Street, Barnstaple.

HENRY ALLISON, M.P.S., recommends his apprentice as Junior; tall; good address; accurate; reliable; early September; Midlands preferred. 93 High Street, Lincoln.

I SHALL be at liberty to manage your Pharmacy in a live and successful manner on August 11, with an excellent London experience and an energetic and ambitious nature behind me; I require a progressive berth where genuine services are appreciated in a practical way; age 32; married; London and suburbs only. "Confident," 15 St. Mary's Road, Harlesden, N.W.10.

JUNIOR (25) desires Locum post; disengaged; experienced in all branches; town or country. Sheppard, Gables, Mark, Highbridge, Somerset.

LADY Assistant; unqualified; ten years' experience; Counter and Dispensing. 186/2, Office of this Paper.

LADY Dispenser (Hall) requires post with Doctor or in Institution; 7 years in present post; knowledge Book-keeping, N.H.I. work, Shorthand-typing and Nursing (partially trained). 182/23, Office of this Paper.

LADY Chemist, qualified, desires post, London or South Coast; free middle September. 184/20, Office of this Paper.

LADY Pharmaceutical Chemist; Hospital Locum; free July 28, for three weeks. 8 Dagmar Road, Stroud Green, N.4.

LIVERPOOL—Unqualified desires post; £3 10s. weekly or nearest; excellent references; total abstainer; 8 years' previous Liverpool experience. 185/39, Office of this Paper.

LOCUM; qualified; varied experience; reliable; disengaged July 28; provincial town preferred. "Chemist," "Spen Wood," Pans Lane, Devizes, Wilts.

LOCUM—Mr. G. Robinson, M.P.S., having disposed of his business, is open to accept engagements as from August 24. 17 Bakewell Road, Eastbourne.

LOCUM; unqualified; 4 years' experience in all branches (passed Part I); free July 28 to August 30; Birmingham and district. "B. A. S.," 205 Crompton Road, Shirley, Birmingham.

LOCUM; vacant August 27 to September 13 inclusive; town or country; highest references. "Locum," 56 Rudloe Road, Balham, S.W.12.

LOCUM; unqualified; 28; West-End experience; good appearance and address; references; free August 11-September 1; London, Eastbourne or Brighton. Cook, 40 Leinster Avenue, East Sheen, S.W.14.

LOCUM; young; good references; free first fortnight in September. "M.P.S.," 23 Coldershaw Road, West Ealing, W.13.

LONDON—Unqualified Assistant, 25, seeks situation; would accept Locum or temporary position; good provincial and recent West-End experience. Webster, 24 Parliament Hill, Hampstead.

MANAGER, Locum; Major; experienced Dispenser, Counter, Photography; references; disengaged August 4. Anthony, 65a Blackwell Street, Kidderminster, afterwards 139 Princess Street, Swindon.

MANAGER or Assistant (Minor qualification) seeks permanent position in Pharmacy or mixed Drug Stores, with living accommodation; good provincial town or seaside; capable; trustworthy; good references and experiences. 186/4, Office of this Paper.

MANAGER; 28; qualified; 12 years' experience; Dispensing, Counter, Photography, Toilet, etc.; sound references; London, Bedfordshire or Hertfordshire preferred; free August 23. "Phone: Hillside 0785, or write, "E. J. F.," 58 Oakfield Road, London, N.4.

MANCHESTER—Chemist, 55, qualified, requires position as relief, part-time, or Locum; good references. 186/19, Office of this Paper.

PHARMACY, Optics, Photography.—Smart, capable Assistant, 30, desires post; whole or part time. 183/38, Office of this Paper.

QUALIFIED, age 27, wants Locum work or permanency London; tall; smart appearance; disengaged; interview any time; 23 years managerial experience, West-End and suburban. Write BM/LO23, London, W.C.1.

ADVERTISING

Remunerative, spare time work. Writing advertisements for proprietary preparations, demands experience of pharmacy and sound knowledge of advertising. Advertising man of wide experience offers

Personal Tuition to Limited Number of Students.

Reasonable Fee. Further details sent on request. Apply 181/11, Office of this Paper.

ALL PUBLIC PHARMACISTS

should join at once

THE NATIONAL UNION OF DRUG & CHEMICAL WORKERS

(Incorporating the National Association of Chemists' Assistants)

BENEFITS: Trade Protection—Legal Aid—Unemployment

Benefit—Free Use of Employment Bureau

Write for particulars:—ARTHUR J. GILLIAN, Gen. Sec. 149 Newington Causeway, LONDON, S.E.1

QUALIFIED; 25; Locum, permanency; London or suburb; high-class experience; Optics, Photography. "Chemist," 61 Victoria Park Road, E.9.

QUALIFIED;—Branch Manager and Senior; capable Dispenser and Salesman; Photography; good all-round experience of many years; well recommended; would invest capital if necessary or view to succession, but not essential. 185/29, Office of this Paper.

QUALIFIED Manager, 38, single, desires post, London district; well experienced in all branches. "M.P.S.," 25 Mayflower Road, S.W.9.

UNQUALIFIED; all-round; 24; first-class Counterman; capable Dispenser; West-End and seaside experience. "Statim," c/o "Yendo," Langley, Slough.

UNQUALIFIED; 45; quick and accurate Dispenser, Counter, Windows, etc.; excellent references; disengaged. "A. B.," 2 Walham Grove, Fulham, S.W.6.

UNQUALIFIED; 20; Windows, Dispensing, Counter, Show-cards; Lancs preferred. "Bob," 28 Clegg Street, Brierfield, Burnley.

WHOLESALE.

A.—AGE 22, experienced in Toilet and Medicinal manufacture; Compressed Tablets, Wet and Dry Counter, also some knowledge Window-dressing; at liberty; willing to go anywhere, good references. 179/18, Office of this Paper.

ADDITIONAL line required; Midlands, Eastern Counties; excellent connection Chemists, Hairdressers, large Stores. Please state terms; strictest confidence observed. "P.," 37 Redland Grove, Carlton, Nottingham.

ENERGETIC Young Man seeks post as Traveller, or inside; some outside experience; good knowledge of the trade 187/1, Office of this Paper.

FIRST-CLASS Salesman, prize records, with established connection amongst Chemists, Hairdressers, Departmental Stores, in the Southern Counties, Midlands, East Coast, desires to represent established House, drug or toilet. 182/30, Office of this Paper.

LONDON OR PROVINCES.—Young fellow, unqualified, 25, seeks position in Wholesale with view to becoming Representative; sound Retail knowledge and some experience on the road; willing to commence inside if necessary. Webster, 24 Parliament Hill, Hampstead.

M.P.S., 25, Public School, desires position of trust with London Wholesale House; sound technical knowledge; excellent references; own car if required. 185/33, Office of this Paper.

QUALIFIED, age 21, 4 years' experience West-End and suburban firms, seeks engagement with London firm of Manufacturing Chemists. P.C.B. 72/8, Office of this Paper.

REPRESENTATIVE desires opportunity, good Chemist and General Stores House; splendid connections; excellent salesman; tackle any ground; motor driver; highest references; disengaged. Box A.R., 238, 65 Bryanston Street, W.1.

SCOTLAND.—Representative, ten years' connection, Perfumery, Toilets, desires change; salary, commission, expenses basis. Gooding, 35 Northfield Crescent, Edinburgh.

SON of Chemist, trained in Salesmanship, seeks position as Representative to Wholesale House or Speciality Firm; age 20; good appearance and address; with knowledge of trade. "P. B.," 185/24, Office of this Paper.

STEADY, reliable man, qualified in England and Ireland, willing to act as Representative in either country. B.C.P. 72/9, Office of this Paper.

TOILET TRADE.—First-class man, covering Northern England and Scotland, seeks touch with leading firm, view to change; very fine connection. 181/4, Office of this Paper.

CLEAR OUT—your Old or Damaged Stock of Photo Goods

Why keep them any longer? Turn them into CASH.

I GIVE BEST PRICES for Old Films (damaged, fogged or expired dates); Packet Papers. Cards (any sizes). Old Photo Goods or Cameras. Bromide Papers. Plates (all sizes, all makes). Send any goods in the photo line. I buy all, good or bad. Cash per return. A good price for all Cameras. Send them along.

S. E. HACKETT, 23 July Road, Liverpool

S.O.S.—EXPERIENCED Traveller, young, seeks post at once with well-known house; steady; reliable; honest; knowledge of all branches of Wholesale trade; established Chemist connection South and West Counties; prospects of permanency desirable; own car; small salary and expenses to start. Cole, 16 Sholing Road, Itchen, Southampton.

TRAVELLER, good connection South Wales and West of England, shortly open to represent good house on the above or other territory; used to spade work. "Asset," 185/10, Office of this Paper.

WESTERN COUNTIES, SOUTH WALES.—Pharmacist, 37, Salesman of ability and a fine record, widely known on this ground, seeks representation; highest credentials; disengaged. Clark, Shirley Road, Westbury-on-Trym, Bristol.

(COLONIAL, INDIAN AND FOREIGN.)

A BROAD.—Responsible, permanent position required by qualified Chemist; 10 years' all-round experience; 21 years in India; age 26; tall. Apply 185/24, Office of this Paper.

YOUNG gentleman, 25, unqualified, desires Continental experience for the coming season; varied experience. Write particulars, "A. P. H.," "Uplands," Marlborough, Wiltshire.

MISCELLANEOUS.

CHEMISTS' FITTINGS.—Silent Salesman Cases, Drugfittings, Wallcases, Dispensing Screens, glass-front Counters, Perfume Cases, Window Enclosures, Glass Shelves, Mirrors, Counter Drawers. Before you decide send to **GEORGE COOK**, the well-known Chemists' Fitter, 27 Macclesfield Street, City Road, London, E.C.1. Forty years' experience.

NEARLY NEW mahoganyised modern composite Wall Fitting, containing 57 glass labelled and knobbed drawers flanked by two large cupboards and surmounted by three plate-glass fronted cases, with drug shelves between, 14 ft. long, 9 ft. 6 in. high overall; new 7 ft. Dispensing Screen, mirror centre, sponge case below, flanked by full length glass cases; large Carboy fits on top centre; at back label and other drawers and large cupboard; £40 the lot, or separate. Seen **INGRAM BROS.**, James Street, Louth, Lincs.

£62 FOR SET OF CHEMIST'S FITTINGS.—8 ft. Drug Fitting, fitted 16 drawers with glass labels and knobs, 10 ft. glass front Counter, 6 ft. Dispensing Screen, Perfumery Case and Desk and Cash Till. Full particulars on request. Always a good selection of Silent Salesmen, Counters, Wall Cases, etc., in stock. **F. MAUND & E. BERG (SHOWCASES), LTD.**, 175/9 and 336 Old Street, London, E.C.1.

£67 10s. FOR PHARMACY FIXTURES, comprising Drug Fixture, Counter with mirror-lined showcase front, fitted at back two rows of drawers, Wall Case, Dispensing Screen fitted three mirror-back show cases, Silent Salesman with three plate-glass shelves, Gledhill Till. Call or write, **RUDDUCK & CO.**, 219 Old Street, London, E.C.1.

£76.—Complete Set of modern mahogany Pharmacy Fittings in excellent condition: 10ft. Drug Fitting, with drawers, lockers and cupboards; 6ft. Wall Showcase; 10ft. Counter, with drawers under; 7ft. Dispensing Screen, complete with label drawers under Compounding Counter. **PHILIP JOSEPHS & SONS, LTD.**, 90-92 St. John Street, Clerkenwell, London, E.C.1.

EXCHANGE COLUMN.

FOR DISPOSAL.

AIR MATTRESS, 5 ft. 6 in. x 8 ft., as Sangers fig. 10; six weeks' use only; accident case; accept £3 3s. Hocken, Reigate.

WANTED.

CINE KODAK OUTFITS wanted, cheap. Send particulars. Durbins, 12 Broadway, Wimbledon, S.W.19.

COPPER PAN required; total capacity about 350-450 gallons; with or without stirrers, coil and jacket. Reply to 183/17, Office of this Paper.

GOWER, Chemists' Bookseller, 41 Voltaire Road, Clapham, wants Pharmaceutical Books, including B.P., Pharmaceutical Formulas, B.P.C., P.J.F., Optical Books, Materia Medica Collections.

PESTLE AND MORTAR OUTDOOR SIGN in good condition State price. Reply 186/33, Office of this Paper.

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£265

IS NOW BEING OFFERED IN

WRIGHT'S COAL TAR SOAP AMATEUR PHOTOGRAPH BEAUTY COMPETITION BABY, SCHOOLGIRL, MAID and MOTHER

What is your Face Value?

Everyone is beautiful in someone's eyes. Mother, baby, twelve-year-old Lucy and eighteen-year-old Joan—you all have an appeal of your own. Here, then, is an opportunity to turn face value to advantage. Enter Wright's simple family competition and win handsome CASH PRIZES. Every photograph will be judged strictly and fairly on its particular

type of charm. Perfection of feature, winsome expression, lovable smile, pleasant homeliness—everyone has some individual appeal. The competition is in four groups—and you can enter any one of them. If you have an attractive child or baby, submit a photograph too. SEND IN YOUR ENTRIES NOW.

Class 'A'	Class 'B'	Class 'C'	Class 'D'
Photographs of children up to 5 years.	Photographs of children over 5 and up to 12 years.	Photographs of girls over 12 and up to 18.	Photographs of girls and women over 18.
First prize £20	First prize £25	First prize £50	First prize £50
Second „ £5.5.0	Second „ £7.7.0	Second „ £10	Second „ £20
Third „ £3.3.0	Third „ £5.5.0	Third „ £7.7.0	Third „ £10
10 prizes of £1.1.0 each.	10 prizes of £1.1.0 each.	10 prizes of £1.1.0 each.	10 prizes of £2.2.0 each.

THE FOLLOWING SHOULD BE CAREFULLY NOTED:

1. Name, address of photographer and class under which the subject is entered, must be written distinctly in ink on the back of each photograph.
2. Photographs submitted must be taken by the sender who must be an amateur. Photographs must not have been previously used in connection with any other competition or published in any way. Prizes awarded to the sender of the photograph and not to the subject.
3. No correspondence can be entered into in connection with this competition.
4. Competitors may send in as many photographs as they like, but each must be

accompanied by three outside printed wrappers from Wright's Coal Tar Soap.

5. Lady Moira Combe and the Editor of the "Daily Sketch" will act as judges and their decision must be regarded as final.

6. The last day for receiving entries is September 30th, 1930; the results will be announced in the London "Daily Mail" and London "Daily Sketch" on October 27th, 1930.

7. Photographs need not be mounted and will be returned provided that a stamped addressed envelope is enclosed for their return.

Address entries to either Class A, B, C or D, "BEAUTY COMPETITION,"
WRIGHT'S COAL TAR SOAP, 44/50, Southwark St., London, S.E.1



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